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S U P P L E M E N T

T O T H E

P E N N Y C Y C L O P Ä D I A

O F

T H E S O C I E T Y

F O R T H E

D I F F U S I O N O F U S E F U L K N O W L E D G E.

V O L U M E II.

H A B E N A R I A — Z I N G I B E R.

L O N D O N:


M D C C C X L V I.

P r i c e T h i r e e n S h i l l i n g s, b o u n d i n c l o t h.
SUPPLEMENT TO THE PENNY CYCLOPÆDIA OF THE SOCIETY FOR THE DIFFUSION OF USEFUL KNOWLEDGE.

[The abbreviations P. C. and P. C. S. signify the Penny Cyclopaedia and Penny Cyclopaedia Supplement.]

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HABENARIA, a genus of plants belonging to the natural order Orchideæ. The tribe has a ringed hooded perianth, a 3-lobed entire spurred lip. There are three species natives of Great Britain.

Habenaria viridisa, the Frog Orchis, has a very short 2-lobed spur, linear 5-pointed lip, the middle point the shortest. The flower is green, and the lip of a brownish colour. It is the Peristylus of Lindley, and the Himantoglossum of Reinwardt. It grows in woods and thickets.

H. biflora, the Lesser Butterfly Orchis, is distinguished by the lip being linear and entire, and the pollen masses parallel. The flowers are white. It is found in heathy places.

H. chlorantha, the Great Butterfly Orchis, has the same general characters as the preceding species; but the flowers are larger and the plant is taller and stouter. The pollen masses ascend obliquely and converge upwards. It grows in moist woods and thickets.

(Babington, Manual of British Botany.)

HABINGTON, WILLIAM, was the son of Thomas Habington, a Roman Catholic gentleman of family and fortune in Worcestershire. His mother, the daughter of Lord Morley, has been supposed to have been the writer of the famous letter which revealed the Gunpowder Plot [Fawkes, G. P. C.]; and her husband (who had been long imprisoned as implicated in Babington's conspiracy) gave shelter to some of the accomplices of Fawkes, and was sentenced to die, but received a pardon through the intercession of his wife's brother, on condition of retiring to his manor of Hindlip. Their son had been born there on the very day now marked as the date of the plot, the 5th of November, 1605. He was educated in the Jesuit college of St. Omer, and afterwards at Paris; and endeavours were used, but in vain, to induce him to enter the society. He returned to England, and lived in retirement with his father, who long survived him, and who directed and cooperated with him in historical and other studies. William Habington married Lucy, daughter of William Herbert, the first Lord Powis; and the whole of his subsequent life appears to have been spent in literary and rural quiet. It is said by Anthony Wood that he "did run with the times, and was not unknown to Oliver the Usurper," a charge which may either be untrue or involve nothing discreditable. He died at Hindlip on the 19th of November, 1644, when he had but just completed his fortieth year. His published writings were the following:—1. "Castara," a collection of poems, first printed together in 1655, and again more fully and correctly in 1659. They were included in Chatterton's English Poets in 1810, were reprinted separately in 1812, and are given wholly in Southey's "Select Works of the British Poets." The name at the head of them is the poetical one he gave to the lady whom he married. They are in three parts: the first containing sonnets and other small pieces, chiefly addressed to his mistress before marriage; the second part containing similar poems, chiefly addressed to her as his wife; and the pieces in the third being mainly religious and contemplative. 2. "The Queen of Arragon, a Tragi-Comedy," acted both at court and at the Blackfriars theatre against the author's will, printed in 1640, folio, brought again upon the stage in 1666, with a prologue and epilogue by the author of Hudibras, and reprinted in all the three editions of Dodson's "Old Plays." 3. "The History of Edward IV." 1646, folio, said to have been partly written by his father. 4. "Observations upon History," 1641, 8vo.

Habington's poems, although infected by the tendency to puerile and absurd conceit which prevailed in his time, are yet in most parts exceedingly delightful. Their fancy is sweet, especially in rural description; their feeling is refined and ideal; the language is correct and tasteful; and the tone of moral sentiment is everywhere pure and elevated. The romantic and chivalrous cast of thought and sentiment gives much interest to his play, although the story is meagre, and the characters are not vigorously depicted.

HABZELLA, a genus of plants belonging to the natural order Annonaceae. It has a 3-lobed calyx; 6 petals, the inner ones smallest; the stamens very numerous; the torus convex; the carpels distinct, indefinite in number, long, cylindrical, obliquely ventricose or torulose, smooth, striated longitudinally, becoming many-celled by the pericarp growing together; many-seeded, the seeds elliptical, arilate, somewhat erect, numerous, shining, one in each of the cells of the ovary; the acicula formed of 2 white unequal obcordate membranes.

H. Ethiopica has ovate-acute leaves, 3 inches long, 12 to 14 lines broad, smooth on the upper surface, and downy beneath; the carpels are pod-shaped, 1-3 inches long, knotted, striated, quite smooth, with the taste of pepper. The fruit has a pungent aromatic taste, and is often substituted for other spices. It is the Piper Ethiopicum of the shops, and the Nuova Ethicoth of Duval and other botanists. It is a native of Sierra Leone. H. aromatica is another species, yielding a pungent aromatic fruit. It grows in the forests of Guyana, and the fruit is used by the negroes as a condiment. (Lindley, Flora Moderna.)

HACKERT, PHILIPP, a celebrated German landscape painter, was born at Prenzlau in Prussia, in 1737. His father was a portrait painter and a native of Berlin, where Hackert spent some time with an uncle who was a decorative painter. He acquired his chief knowledge of painting, however, by copying good pictures; and he derived great benefit also from the acquaintance of Le Sueur, the director of the Berlin Academy, and of Sulzer. In 1765 he visited Paris, and in 1768 went, with his brother Johann, to Italy. They spent some time in Rome sketching and painting the scenery about Albano and Tivoli; many of their works were purchased by Lord Exeter. Philipp's first works of importance however were the six large pictures of the Russian

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naval victory of Tchefesme, and the burning of the Turkish fleet, by Count Orlov, in 1770, painted for the empress Catherine II. of Russia, and for which he was paid 20,000 zecchini, about 16,000 florins, to whom the works were sent at Leghorn, was upon the whole highly gratified by their successful accomplishment, but he was totally unsatisfied with the representation of the explosion of a ship, in the picture of the burning of the fleet; and in order to give the artist a proper impression of such a catastrophe, he ordered, with a spirit worthy of an autocrat, one of the frigates of his fleet, an old vessel, to be blown up in the presence of Hackert, in the roads of Leghorn, and he was well satisfied with the results of his experiment, for Hackert greatly improved the picture. These works, with six other similar subjects, were exhibited at St. Petersburgh, the year in which the first-mentioned pictures were completed, Johann Hackert died at Bath, aged only twenty-nine; he came to England with some pictures which had been ordered by English travellers for home, his brothers, Wilhelm and Karl, joined Philip in Rome, but Wilhelm went shortly afterwards to St. Petersburgh, and died there in 1780, aged only thirty-two, and Karl settled in Switzerland. Philip accordingly set out for his youngest brother Georg, who was an engraver at Berlin, and they lived together from that time until the death of Georg at Florence in 1795.

Hackert was highly patronised in Rome both by Italians and foreigners; Pius VI. was delighted with his works, and his reputation as a landscape painter was unrivalled by any of his contemporaries, although he was a pupil of Wilson, who was not received nor known at that time: Wilson left Rome in 1755. In 1777 Hackert made a tour in Sicily with Richard Payne Knight and Charles Gore; and in 1778 to the north of Italy with Charles Gore and his family. In 1782 he went to Naples and was presented to the king, Ferdinand IV., by the Russian ambassador, Count Rassamunovsky. The king took great pleasure in the pictures of Hackert, and treated him with great kindness and familiarity; he used to style him Don Filippo. In 1786, after the departure of Count Rassamunovsky, he appointed Hackert his preferred painter, who settled with his brothers from that time in Naples. They had apartments in the Palazzo Francavilla on the Chiaja, where they occupied until they were dismissed by General Rey, the French commandant in Naples, in 1789, who took possession of them himself; he however treated the Hackerts with great kindness, gave them passports, and suffered them to depart with all their goods and chattels, with which they arrived safely at Leghorn, and treated him with great kindness and familiarity; he used to style him Don Filippo. In 1786, after the departure of Count Rassamunovsky, he appointed Hackert his preferred painter, who settled with his brothers from that time in Naples. They had apartments in the Palazzo Francavilla on the Chiaja, where they occupied until they were dismissed by General Rey, the French commandant in Naples in 1789, who took possession of them himself; he however treated the Hackerts with great kindness, gave them passports, and suffered them to depart with all their goods and chattels, with which they arrived safely at Leghorn, and there he was welcomed both in Naples and at Caserta. In 1787 Hackert painted a large picture of the Battle of the Parthenope, 64, the first ship of war which was built for Naples; it was engraved and published by his brother Georg, who painted five other large pictures of Neapolitan seascapes, which were all enlivened by some historical scene of interest; they are in the palace at Caserta. In 1788 the king appeared in Leghorn on a state visit, and Hackert was presented with a bottle of champagne on that coast, which he painted, from Manfredonia to Taranto. In 1790 he visited on a similar mission the coasts of Calabria and Sicily, and the king gave him several connoisseurs, a swappiana, and two cabinet makers for twelve months for the express purpose; he was out about five months, from April to August inclusive.

Hackert lived, after his departure from Naples in 1799, a short time in Leghorn, whence he removed to Florence, where he resided in a villa which he purchased in 1803, until his death in April, 1807.

Hackert's works are not remarkable for any particular quality of art: they are simple portraits or prospects in ordinary light and shade, and their beauty accordingly depends upon the local beauty of the scene. The detail is careful, without being minute, and where a momentary air of any particular scene is the chief object of desire, his works are calculated to give perhaps complete satisfaction, except in the case of some fastidious connoisseur who might require a bolder and more artistic foreground than those which characterise his works generally. His drawings are extremely numerous, and his paintings are not rare; many of them have been engraved. He painted in oil, in mezzotint, and in water-colours on a warm ground, and in a species of tempera. He also etched several plates.

Goethe has written a eulogistic Life of Hackert, whose close intimacy of nature delighted the German critic, and he has extolled him beyond his merits; while he compares Flaxman with Salatelli, and damn his noble designs with the faint praise that they have some pretty ideas in them; he concludes thus in the deriding of Count Orlov, (Goethe, Werke—Philipp Hackert; and Winkelmann und sein Jahrhundert.)

HAC (in italics). The derivation of the word Hackney, as applied to a class of public conveyances, has occasioned much speculation. Bailey, in his Dictionary, adopts what appears to have become a popular notion, that the name is derived from the suburb of London so called, for which supposition however we find no plausible ground; but he adds, 'unless you would rather have it from the French Hackney'; this is a word of similar meaning. Many other conjectures are made, 'from Johnson's Dictionary,' and in the lexicographical division of the 'Encyclopædia Metropolitana.' From these it is evident that a similar word is found in most European languages. Regulated fares, calculated form, time by time or distance, and, thus: -equus, okus, aquis, akiness, aikens, haquens. Another conjecture derives it from an Anglo-Saxon word meaning to neigh, on the supposition that a lively horse, given to neighing, would be the most likely to be hired for hire. Perhaps the most probable derivation is from hague, an old French word for a gelding, which would be a finer and more spirited horse for hire than any other; but this may be, it is sufficiently evident that the term hackney was first applied to horses let for hire, and then, by a very natural transition, extended to coaches, and subsequently to sedan-chairs and certain other devices for hire, and that it is applied to all those forms of carriage which perform a certain specific journey, at a specified time, carrying passengers only in the line of its specified route, at a certain fare (which is not regulated by act of parliament), for each individual passenger, the sole privilege of being usually, though not invariably, dependent upon distance. So far as can be gathered from such notices as the writer has met with, this class of public vehicles appears to have originated in London before the period when the centres of metropolitan life were beginning to extend outside the metropolis, and the convenience of such a vehicle was greatly increased by a reduction in the number of horses with which it was harnessed. They are calculated for conveyance of six or eight persons, together with luggage, and to perform a certain specified journey, at a specified time, carrying passengers only in the line of its specified route, at a certain fare (which is not regulated by act of parliament); for each individual passenger, the sole privilege of being usually, though not invariably, dependent upon distance. 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issued to the master of the horse in 1637 to grant licences to fifty hackney-coachmen in and about London and Westminster, and as many others as might be needful in other places in England, the number of horses not being reduced to more than twelve horses. In 1652 the number of hackney-coaches daily plying in the streets was limited to 200; in 1654 it was increased to 300, allowing however only 600 horses; in 1651 to 400; and in 1654 to 700. By an act of the last year of Anne (c. 23) the number was to be increased to 800 on the expiration, in 1715, of the licences then in force, and 200 hackney-coaches were also licensed. The number of chairs was then increased to 800 on the same act. In 1717, the act 12 Geo. 1. c. 15, was repealed. In 1771 the number of coaches was further increased to 1000.

Now, notwithstanding this steady increase in the use of hackney-coaches, they were long assailed as public nuisances in a way which it is amusing to look back upon. Some curious details on this subject are given in Knight's 'London,' vol. i. p. 97, &c., from which it appears, by a quotation from a letter of Garrard, that the first hackney-coach stand was established in 1854, by one Captain Baily, at the May-pole in the Strand. Even so late as 1860 Charles II. issued a proclamation against hackney-coaches standing in the streets to be hired; but on the very day it was to come into force, Pepys records that he got one to carry him home. The monopoly long enjoyed by the London hackney-coachmen produced great difference to the increasing use of such conveyances. In 1823, while that monopoly was undisturbed, hackney-coaches appear to have sunk lower and lower in the scale of efficiency. For some two hundred years, observers Mr. R. H. M. Bury has found, the drivers of these red-coated hired carriages had seen the hackney-coach passing through all its phases of dirt and discomfort; the springs growing weaker, the 'iron ladder' by which we got in and out, the rickety body, the smoke-stained hemp and straw, the fiendish cushion more redolent of dismal smells, the glasses less air-tight. So slow, also, were their movements, that it was almost hopeless to think of gaining time by riding in them.

While this was the state of things in London, a lighter kind of vehicle, drawn by one horse, had been brought into extensive use in Paris. In the year 1818, according to a paper on the 'Vehicular Statistics of London,' in No. 78, new series, of 'Chambers's Edinburgh Journal' (to which we are indebted for many of the following particulars), there were no less than 1150 of these vehicles, which were called cabriolets de place. Efforts were made to introduce similar vehicles into this country, but, owing to a regard for the 'vested rights' of the hackney-coach owners, it was long impossible to get licences for them. Were they not difficult Debours. Broth- shaw and Rotch (the latter a member of parliament) obtained licences for eight cabriolets in 1823, and started them at fares one shilling less than those of hackney-coachmen. The new vehicles were horse-chaises, drawn by a horse, and carrying only one passenger besides the driver, who sat in the cabriolet (or, as more commonly called for brevity, the cab), with a window on either side of the coach, the whole of which room was provided for a second passenger, and the driver was separated from the fare; and with the rapid extension of this lighter class of vehicles, numerous varieties of construction have been introduced, in most of which the original model is completely lost sight of, but in which comfortable and safe accommodation, with complete shelter from the weather and separation from the driver, is provided for two, three, or, in a few cases, four. The name 'cab' is still commonly applied to all hackney-cabriolets drawn by one horse, whether on two or four wheels. During the first few years of the employment of such carriages their number was restricted to sixty-five, while the number of coach-licences was increased to twelve hundred; but in 1832 all restriction as to the number of hackney-cabriolets was removed, and in the paper above referred to it is stated, on the authority of information received from the registrar of hackney-carriage licences, that the number of hackney-cabriolets licensed for use during the year ending January 4, 1846, was 2450, all of which were coach-like in appearance; there were also 581 one-horse vehicles. The number of drivers licensed during the year ending May 14, 1844, was 4927, besides 371 'watermen,' or attendants upon the 130 regular metropolitan coachstands.

While the changes above noticed have greatly benefited the public, there is reason to fear that the great increase of accommodation has not been accompanied by any elevation of moral character in the large class of men engaged in this business. Since the year 1822 hackney-carriage drivers have been required to deposit any articles which may be accidentally left in their vehicle, and no licence to an hackney-coach to whom the owners of the lost property may apply for its restoration, upon paying for the driver's time and trouble; and, incredibly as it may appear, the estimated value of the property thus taken to the Treasury has been considerable. In the first four years of the introduction of this rule is estimated at 45,000L., while very few applications were made for property which was not thus restored. Of late years however the case has been very different, for which reason the board of trade, under the introduction of this rule is estimated at 45,000L., while very few applications were made for property which was not thus restored. Of late years however the case has been very different, for which reason the board of trade, under the introduction of this rule is estimated at 45,000L., while very few applications were made for property which was not thus restored. Of late years however the case has been very different, for which reason the board of trade, under the introduction of this rule is estimated at 45,000L., while very few applications were made for property which was not thus restored.
are of a green colour, and Kotsch and others on this account have proposed the name Microcystis for this genus of plants.

The species are found upon moist rocks, on the walls of caverns, and in damp places. Mr. Hassall has recently described several new species of this genus; they belong however to a genus in which it is difficult to discover permanent specific characters. [Red Snow, P. C.]

Hassall, British Frightenater Algae.

AECUTICO COMBENDRED, WRIT DE. (HERBERT, P. C. S.)

HAGUE, ALLIANCE OF THE. As the general war which was terminated by the Peace of Ryswick in 1697 (P. C.) preceded by what is called the First Grand Alliance, concluded at Vienna between the Emperor and the United Provinces, 12th May, 1689, and joined by Great Britain 9th December following, so the next general war, which broke out in 1702, was preceded by the Second Grand Alliance, or Alliance of the Hague, concluded at that town between the Emperor, Great Britain, and the United Provinces, 7th September, 1701, and subsequently joined by Portugal and other European powers. Its object was to resist the seizure of the Spanish crown by the French king Louis XIV. for his grandson the Duke of Anjou, who nevertheless eventually became King of Spain, by the title of Charles III. The Alliance of the Hague was the last political combination arranged by William III. of England, who died 8th March, 1702; and war was declared against France by Queen Anne 4th May following. [Partition Treaties, P. C., xvii. 292.]

HAGUE, SAMUEL, found of Leiden. He discovered that the system of medicine called Homeopathy, was born at Meissen, in Upper Saxony, on the 10th April, 1755. His father, Gottfried Hahnemann, who was an artist of considerable merit, was employed in the manufacture of China in the extraordinary factory of the iron and porcelain manufactories of Meissen. He was a clever well- educated man, and to him his son owed the first sediments of his education. He was afterwards placed at an elementary school, the director of which, with the remarkable talents that only required cultivation to raise the boy to eminence, persuaded his father to place him at the High School of Meissen, into which they obtained for him a free admittance. Hahnemann gladly availed himself of these increased facilities; he made himself master of Latin, Greek, and Hebrew, and evinced a decided bias for the study of the physical sciences, natural history, and medicine. Botany was also a favourite pursuit, and his hours of leisure were devoted to the collection of plants and their systematic arrangement. His intense application and amiable disposition won the goodwill of the head master and teachers, who vied with each other in affording him every facility in the prosecution of his studies; and his progress was so rapid, that in a short time he was appointed an assistant teacher.

He was of medicine for his profession, at the commencement of 1775 he left the high school of Meissen, and, assisted by the friendship of his former teachers, he entered the University of Leipzig, having, as a candidate, written a Latin dissertation on the distinction of the qualities of life. 1758, p. 122.

Being wholly dependent upon his own exertions for subsistence, he supported himself during his residence at Leipzig by giving lessons in German to foreign students and by the translation of English and French medical authors. The professors of the University, in admiration of his ardent zeal for knowledge and great acquirements, invited him to attend their lectures gratuitous. Having passed two years in the study of the theory of medicine, and saved a small sum of money, he departed for Vienna, there being no clinical lecturer in the University of Leipzig and entered himself at the Hospital of Charitiable Brothers, with a view to the completion of his knowledge and to acquiring a practical knowledge of his profession.

His moderate pecunary resources were almost exhausted, when his talents and marked attention to his duties gained for him the esteem and attachment in which it is singular that, after a long residence in the corners of Siebenbürgen, then residing at Herrmannstadt.

He remained here for two years, and being allowed to attend private practice he saved a small sum of money; with this he removed to Leipsic, 10th of August 1779, he took his degree of M.D., and produced his thesis 'Conspicuous Adflectum Spasmodicorum Etiologicum et Therapeutics.'

In the year 1781 he was appointed district physician at

Gomern, near Magdeburg, where he married the daughter of an apothecary named Köhler. Previous to this he had resided some time at Hettstadt and Dessau, diligently pursuing, in addition to his professional labours, the studies of chemistry and mineralogy.

In the year 1784 he removed to Dresden, where he gained a high reputation in the hospitals as a judicious and skilful practitioner, but, struck with the absence of a guiding principle in therapeutics, and the great uncertainty of the healing art, he gradually withdrew himself as much as possible from practice, and endeavoured to support his family by his old resource of translations of English and French medical authors, by the reading of which he continued pursuing at the same time his favourite study of chemistry.

His feelings at this period are best explained in his own words in a letter to the celebrated Hufeland, written many years after he had founded the system with which his name is now so intimately connected. 'Eighteen years have elapsed since I quitted the beaten path in medicine. It was agony to me to walk in darkness, with no other light than could be derived from books, when I had to heal the sick, and to prescribe, according to such or such an hypothesis concerning disease, substances which owe their place in the Materia Medica to an arbitrary decision. I could not conscientiously trust to the conditions of my suffering brethren by these unknown medicines, which being very active substances, may, unless applied with the most rigorous exactness (which the physician cannot exercise, because their effects are not known), destroy health, and possibly produce death, or produce new affections or chronic maladies often more difficult to remove than the original disease. That I might no longer incur the risk of doing injury, I engaged exclusively in teaching, giving up practice in 1784.'

About this time he published his pamphlets on Mercurius Solubilis; on the mode of detecting Adulterations in Wine; on Calculus Sulphuratus; and on the Detection of Arsenic in Meat, with which he contributed to Crel's 'Chemical Annals,' and gave to the world a number of minor medical works, which have since been collected by Dr. Stumpf, and published under the title of 'Kleine Schriften,' Dresden and Leipzig, 1829.

In the year 1790, while engaged upon the translation of the 'Materia Medica' of Cullen, he was struck with the different explanations given of the mode of operation of Peruvian Bark, in intermittent fever: and dissatisfied with them, he determined to try its effects upon himself. Finding that powerful doses of this substance produced symptoms strikingly analogous to those of that fever, he endeavoured to establish the idea that it was an acknowledged specific, he determined to try further experiments with other medicinal substances upon himself and upon some medical friends. He obtained similar results: and so by these agents he was enabled to state that there exist disorders resembling the diseases of which they were esteemed curative; and thus, the first dawn of the law of Similia Similibus gleamed upon him. In a work ascribed to Hippocrates, Ed. Bar. 1737, p. 127, he quotes the words: 'Curatur simile similibus,' and he explained his discovery: and the same doctrine has since found advocates in many eminent medical writers; but Hahnemann was the first who assumed it to be the guiding principle in Therapeutics, and supported his position by a series of experimental demonstrations. Confident that he had discovered the long sought for law, he assiduously pursued his proving of medicines, and adopted the new principle in the treatment of his patients with (according to his own testimony and that of his disciples) a success fully commensurate with the limited means then at his disposal. Thus encouraged, he ventured, in 1796, to address a paper to Hufeland's 'Journal,' in which he announced his new discoveries in medical science and endeavoured to point out the defects of the 'Materia Medica' as then constituted, and the necessity of its reconstruction upon the basis of pure experiment; at the same time he earnestly invited the cooperation of his fellow physicians. To the Germans this appeal was not immediately heard; but the German physicians were then deeply engaged in the investigation of the Bruennonian theory, and Hahnemann's suggestions were coldly received.

In 1801 he published a short treatise on the efficacy of Belladonna for the prevention and cure of scarlet fever, and affirmed that its curative properties were based upon the homoeopathic law. In 1805 he published the results of a number of experiments in a work entitled 'Fragmenta de Viribus Medicamentorum positivis, aevi obvivis in Corpore Sano,' and in the same year his 'Medicinae Experience,' in which he still more strongly expresses his objection to the old system of medicine. In 1810 he broug
out his great work, the 'Organon of the Healing Art,' in which he gave, in a remarkable form, the Systems of medicine; and for the first time gave it the name of 'Homoeopathy,' by which it has since been distinguished. [Homoeopathia, P.C.S.] In 1811 the first part of the 'Materia Medica Pura' was published, by whom a number of substances till then not fully completed in the year 1821, since which time five editions have been published.

In the year 1812 he returned to Leipzig, where he was appointed Magister Legum. To prove his qualifications for this chair, he wrote an excellent treatise on the heliobole of the anterior, 'Dissertatio historico-medica de Heliochorismo Veterum.' At Leipzig he had an extensive practice, and was assisted by a great number of his pupils, proving the excellency of his medicines. The apothecaries of that city, however, rose against him, and appealing to an old law long dormant, that forbade a physician to dispense his own prescription, he was succeeded in 1820 in obtaining a decision in their favour. Hahnemann, unwilling to risk his own reputation and that of his system upon medicines prepared and dispensed by individuals avowedly hostile to his medicine, had determined to retire from practice, when the Duke of Anhalt Cöthen offered him an asylum in his dominions, with the enjoyment of those privileges of which he had so much need of the support of his patients. For Cöthen, in the year 1828, that he published in four volumes his work on 'Chronic Diseases, their Peculiar Nature, and Homoeopathic Cure.' In the year 1829 the disciples and admirers of Hahnemann in that city struck a new system, and marked their attachment to the new system and their esteem for its founder. It bore on the face the head of Hahnemann, with the inscription, 'Samuel Hahnemann natus Mienae p. x. Aprilis. MDCCCLXX.' His adherents at this time were, 'Similla Simillibus;' the inscription, 'Medicinæ Homoeopathicae Auctori, Discipuli, et Amici, p. x. Augusti MDCCCLXX.' His adherents at the end of his life were, 'In memoriam Hahnemann. \textit{Medicinae Ac nostrae causa, patria,} in sua parte, haec praebet.'

Hahnemann has been a widower for some years, he married in 1835 a French lady, Melanie de Herelle, who had visited Cöthen for the benefit of his advice, and at her desire he removed to Paris. In commemoration of his marriage in the French capital, an admirably executed medal by David was struck, in bronze, silver, and gold, bearing on its face the head of Hahnemann, with the inscription 'Samuel Hahnemann.' On the reverse, in the centre 'Similla Simillibus curatur,' engraved by a snake; the inscription, 'Les Homoeopathistes Francais à leur Maitre. Né à Meissen le 10 Avril, 1755, Venu en France le 25 Juin, 1833.' He remained at Paris in the active exercise of his profession, and surrounded by numerous friends of his system, of all ages, from the time of his decease, which took place on the 2nd July, 1843, in the eighty-ninth year of his age.

Hail. [Snow, P. C., p. 160, col. 2] The principle of insurance has been recently applied to indemnify persons for the very heavy losses sometimes occasioned by these meteorological phenomena, both by the Royal Farmers' and General Insurance Institution and by a society connected with the Norwich Union Insurance Company. The uncertainty which exists in reference to the occurrence of these frequently calamitous storms in any particular locality, and the circumstance that, while no human sagacity can foresee or prevent them, it is utterly impossible to produce them by fraud, appear to render such casualties peculiarly fit, so soon as observation and experiment shall have enabled us to predict accurately the average risk, for the application of a principle which has long been applied to casualties of a nature less uncertain, more easily provided against, and which afford greater opportunities for deceit and imposition. The Hail-storm Insurance societies have published chronological lists of the most remarkable hail-storms in this country during the present century, which present an array of destructive calamities far exceeding what might have been expected from their rarity. It is curious also to observe that they appear to have increased in frequency of late years. In one case, which we select solely from the more circumstantial way in which the details are given, many farms of considerable extent, &c., were destroyed in the parishes of Hertford, Middlesex, and Essex; the damage done upon a space of 3487 acres in the last-mentioned county alone was estimated at 14,574l., or about 4fl. 7s. 7d. per acre, upon an average. It is stated that this was the third time within a period of thirty years that the crops in the northwestern part of that county had been destroyed in like way. During the great hail-storms in the months of July and August, 1843, by which immense damage was done in Cambridgeshire, Norfolk, Suffolk, Essex, Hertfordshire, Berkshire, Kent, Oxfordshire, Gloucestershire, and Yorkshire, several cases of individual loss amounted to upwards of 2000l. The breakage of glasses in windows and skylights, and especially in conservatories and bothies, is one of the most frequent injuries sustained by the latter, the masses of ice which fall becoming sometimes sufficient to demolish the wooden framework also. Such extraordinary cases of devastation will be fully accounted for if it be considered that, as it is stated in a paper issued by the Farmers' Insurance Institution, on the authority of 'Leslie's Elements,' hailstones having a diameter of two inches, a size which has been exceeded in several well-authenticated cases, will fall with a velocity of 1154 feet in a second, or more than 44 mile in a minute. On the 19th of May, 1809, it is estimated that 200,000 panes of glass were broken in London alone, besides great damage being done in fields and gardens, and the foliage and branches of trees being cut off. An equal number of panes is supposed to have been broken in the northern suburbs of the metropolis on the 30th of July, 1826. Hailstorms of from six to the sees, and severe storms of the above-mentioned description, are frequently mentioned as having fallen in this country, if the lists referred to, which are compiled from contemporary publications; and on the 3rd of August, 1824, when the eastern part of Suffolk was visited by a violent hail-storm, by which hails, fowls and game, as well as glass and crops, were extensively destroyed, the ice accumulated in some places to a surprising depth. In many cases a considerable extent of ground has been covered to the thickness of several inches. It is worthy of remark how very large a proportion of the destructive storms recorded have occurred in the months of June and July. Without noticing the cases in which two or more storms which occurred on the same day are alluded to as one, which would render this proportion yet more remarkable, the cases recorded in the above-mentioned lists are as follows. We have, of course, taken care to but once those storms of which two separate accounts are given—

\begin{tabular}{|l|l|}
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In the month of & 0 \\
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January & 0 \\
\hline
February & 1 \\
\hline
March & 1 \\
\hline
April & 3 \\
\hline
May & 7 \\
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June & 10 \\
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July & 10 \\
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August & 4 \\
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September & 2 \\
\hline
October & 0 \\
\hline
November & 0 \\
\hline
December & 0 \\
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\end{tabular}

In the article 'Hail,' in Brande's Dictionary of Literature, Science, and Art, are some curious facts collected from various sources, from which it appears that hailstones have been found weighing from five to twelve or thirteen ounces, and of all sizes up to about fourteen inches in circumference; the largest being frequently of very rugged and irregular form, resembling portions of a great sheet of ice broken to pieces rather than balls of ice. 'Hail,' according to this authority, 'usually precedes storms of rain, sometimes accompanies, but never or very rarely falls in storms of rain without an equal extent of hailstones of such size as to be larger than balls of ice.' Hail is said to be always accompanied with electrical phenomena, and it is generally believed that such are the preliminary effects of its formation. The particulars of hail-storms published by the Farmers' Insurance Institution, which gives references to authorities, and in many cases minute details of the damage done, appeared in the advertising sheet of the 'Farmers' Almanac' for 1845.
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HALFORD, SIR HENRY, was born on the 2nd of October, 1766, and was the son of Dr. James Vaughan, physician to the Infirmary at Lancaster, and author of "Observations on Hydrophobia, on the Casuarina Section, and on the Effects of Cantharides in Paralytic Affections." Sir Henry received his education at Cambridge, and was afterwards admitted at Christ Church, Oxford; he graduated in medicine at Oxford in 1794, and was elected a fellow of the College of Physicians in the same year. Having been well introduced to London society, and being distinguished for the elegance of his manners, and having early married a daughter of Lord St. John, it was not long before his practice became considerable. He was appointed by George III., one of his physicians, and in 1798 had the good fortune by the death of his mother's cousin, Sir Charles Halford, and changed his name from Vaughan to Halford. He was made a baronet in the same year. Sir Henry continued to hold the office of physician to George III. till the king's death, and subsequently held the same appointment under George IV., William IV., and Victoria I. He was appointed president of the College of Physicians in 1824, and delivered the oration on the occasion that body receiving from their old building in the City to the new one in Pall Mall.

During his professional career Sir Henry was too much occupied with the kind of practice to which his early connexions in life introduced him, to contribute much valuable information to the literature of his profession. His publications consist of" Estimations of the Average Price of the Different Sorts of Beef and Mutton," before the college, and are written in Latin, and exhibit a purity of style beyond the average of such productions at the present day. His essays are as follows: 1. On the Cite. 2. On the Articulatic. 3. On the Estimation of Symptoms in the last Stages of Some Diseases. 8. On the Tis Doulouрез. 4. On Shakespeare's Test of Insanity. 6. On the Influence of Some Diseases of the Body on the Mind. 6. On the Laws of Articulation. 7. On the Treatment of Gout. 8. On Phlegmias Doloris. 9. On the Treatment of Insanity. 10. On the Death of some Illustrious Persons of Antiquity. 11. On the Education of a University Boy. In 1809 he published a collection of essays and papers displaying the elegant scholar and observant physician, and are mostly written in an easy graceful style. In 1813 Sir Henry Halford descended with the Prince Regent into the royal vaults of St. George's Chapel, Windsor, where, amongst other curiosities, they discovered the head of Charles I. Of this visit and discovery Sir Henry has given an account, which is deposited in the British Museum, and is authenticated by the signature of the Prince Regent. He died on the 9th of March, 1844. He had been for more than twenty years president of the College of Physicians, and was an instrumental in forming the evening meetings of that body. His urbanity of manners and devotion to the interests of the college have left behind them a grateful recollection amongst the members of that corporation.

(Pettigrew, Portraits and Memoirs of Medical Men; Transactions of Medical and Surgical Association, vol. I.)

HALIFAX, GEORGE MONTAGU, EARL OF, was the fourth son of the first Duke of Grafton. He was born at Stone, in Southamployshire, who was the eldest daughter of married in 1641, on this account. He was appointed to the king's chamber in 1661, and was eventually sent to Westminster School, where he was chosen a king's scholar in 1677, and whence he in 1682 was removed to Trinity College, Cambridge. He had distinguished himself, while a pupil of Bubb's at West- minster, by his extraordinary good fortune and skill in dealing with the top of his fingers, and these qualities of talent served itself in a way to attract wider attention in an obituary of English verse which he produced on the Death of Charles II., in February, 1685, beginning (not at all in just or satire)" in The same strain till at last the poet exclaims:" in Charles, so good a man and king, we see April, 1681."

This performance, we are told, so charmed the Earl of Dorset that he induced the young poet to come up to town, where he was introduced by his lordship to all the wits of his acquaintance. In 1687 he and Prior brought out in conjunction their surlesque upon Dryden's "Hind and Panther," entitled "The Hind and the Panther transverse to the Story of the Country fried a chronicle; and proceeding in the same strain till at last the poet exclaims:"

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Mouse and the City Mouse. ' It is for the greater part a dialogue in prose, apparently in imitation of the Duke of Buckingham's 'Rehearsal,' with the parody in verse of Shakespearian and Jonsonian interludes. The parts of it are said to be Prior's, as may very well be believed; it is not, however, printed in the common collections of his poetry; but it must be a joke does not work in the "Modern Poets" (1750), vol. i. pp. 47-82, under the head of 'Additions to the Works of the Earl of Halifax.'

Montagu appears to have some time before this entered upon the love of poetry, by stating in the very title of the 'Works of the Poets,' merely says that he signed the invitation to the Prince of Orange, and sat in the convention; but his signing the invitation to the Prince would seem to imply that he had occupied some public post; and he is, therefore, we suppose, the Charles Montagu who is set down as one of the members for the city of Durham in James II.'s parliament which assembled 15th May, 1685. In the convention parliament he sat for Wakefield; he was returned for the same place to the next parliament, which met in March, 1690. It is stated to have been about the time of the Revolution that he married the Countess Dowager of Warton: she was Anne, widow of Robert, third Earl of Manchester, and daughter of Sir Christopher Yelverton, Bart.

According to Johnson, it was his intention when he formed the scheme for the new house of Commons, as he was disposed to be a liberal patron of arts and sciences, to reward the services of the poets by a premium of 1500l. in reward of their labors in the rebellion of the court of the Duke of Buckingham. He was, therefore, we suppose, the Charles Montagu who is set down as one of the members for the city of Durham in James II.'s parliament which assembled 15th May, 1685. In the convention parliament he sat for Wakefield; he was returned for the same place to the next parliament, which met in March, 1690. It is stated to have been about the time of the Revolution that he married the Countess Dowager of Warton: she was Anne, widow of Robert, third Earl of Manchester, and daughter of Sir Christopher Yelverton, Bart.

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establishment of a public library, out of which eventually came the Free Library Company.' (Burke, ii. 440.)

Having always kept up a connexion with the Hanoverian family, Lord Halifax was found, on the death of Queen Anne, to be one of the nineteen persons appointed by the new king to be offered to the electorate of Hanover till his majesty should come over. On the 14th of October, 1714, he was raised to the dignities of Earl of Halifax and Viscount Sunbury, and was restored at the same time to his former post of first lord of the Treasury, his office of auditor of the Exchequer being given to his nephew. But he died of an inflammation of the lungs on the 19th of May in the following year. He left no issue, so that his earldom and viscounty became extinct; but he was succeeded in his barony according to the limitation by his nephew George Montagu, who a few weeks after was made Earl of Halifax and Viscount Sunbury by a new creation. The son of the second Earl of Halifax died without issue in 1723, when all the honours became extinct.

Halifax was one of the most constant of the Whig party to whom we are indebted for the Revolution, the Hanoverian Succession, and the Union with Scotland. It is evident also, from the detail that has been given, that he was a person of great general ability. But he was much more a man of action than of any remarkable powers of thought; and what he wrote, whether in verse or prose, is of very little value. A list of his pieces is given by Walpole in his 'Royal and Noble Authors.' His character as a patron of literature has been delineated by Walpole with great accuracy and taste, and is the same as that of William III. 'Full-blow'd But, by Pope, in his 'Prologue to the Satires.'

HALL, REVEREND ROBERT, was born the 2nd of May, 1764, at Aynsham in Leicestershire, where his father, the same year, had been instituted as minister of the congregation of Particular Baptists. He had come from Northumber- land, where his forefathers belonged to the class of yeomen; and he is stated to have been a man, though not of much learning, of confident and active native powers of mind. He is the author of several short religious publications: one of which, entitled 'A Help to Zion's Travellers,' was several times printed.

The subject of this notice was the youngest of fourteen children. It is related that he was two years old before he learned to speak: but after this, the progress he made in all branches of his education was very rapid. Though the circumstance is absurd, it is an evidence of the impression he had made by his precocity—that when he was only twelve years old, a fellow-clergymen of his father's (Mr. Beeby Wallis, of Oakley, Northamptonshire), who was a literary man, had set him at eleven years and a half to learn Latin in the native village, a member of his father's congregation.

He lost his mother in 1776, and it appears to have been after her death that he was sent to be educated at a Baptist school in Northampton, kept by the Rev. Dr. John Ryland. Here he remained for a year and a half, after which he was placed, in October, 1778, at the Bristol Academy, with the view to his becoming a Baptist clergyman. It is the practice, it seems, for such students to commence their education before they have finished their education; and Hall was, as it is expressed, set apart as a preacher by his father's congregation in August, 1780. In the autumn of 1811 he was selected by the autho- rities of the Bristol Academy to be sent to King's College, Aberdeen, on which is called Dr. Ward's exhibition; and here he studied for the usual period of four winter sessions; preaching, in the meantime, in the intercessory services. It was at Aberdeen that Hall and the late Sir James Mackintosh, then also a student at King's College, became acquainted.

The treatment he met with in Aberdeen was such as to spring up between them led to an affectionate friendship, which lasted while they both lived.

Hall did not finally leave Aberdeen till May, 1785; but he had already, during the preceding summer, officiated as one of the regular pastors of the Baptist congregation at Broadmead, Bristol, in association with Dr. Caleb Evans; and in August of the same year, he was also appointed classical tutor in the Bristol Academy. His father died in 1791, and the same year a difference with Dr. Evans led to his removing from Bristol and accepting an invitation to become pastor of the Baptist congregation at Cambridge on the departure of the Rev. Robert Robinson to be successor to Dr. Priestley at Birmingham.

He had already acquired considerable celebrity as a preacher, but it was not till now that he appeared as an author; and the impulse that sent him to the press was rather the political than the religious. But Hall was succeeded in his barony according to the limitation by his nephew George Montagu, who a few weeks after was made Earl of Halifax and Viscount Sunbury by a new creation. The son of the second Earl of Halifax died without issue in 1723, when all the honours became extinct.

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of thought or even of knowledge; and are therefore nothing more than a record or memorial of what their author was.

Basil Hall, R.N., was born at Edinburgh in 1788. His father Sir James Hall, Bart., of Dunbar, was President of the Royal Society of Edinburgh. In 1788 he was the author of 'Essay on the Origin, Principles, and History of Gothic Architecture,' published in 1813, and a frequent contributor of scientific papers, chiefly on geological subjects. He was prominent in the scientific life of the day, and in 1817 he was married to Helen, a daughter of the fourth Earl of Douglah.

Basil Hall entered the Royal Navy in 1802; in 1808 received the command of a vessel of the same name of the St. Donat, and in 1817 he was made a post-captain. The opportunities which the naval profession afforded both for scientific pursuits and the study of men and manners in various parts of the world came in Captain Hall's case to lead him into scenes of more than usual interest; or perhaps it would be more correct to state that his eager and indefatigable pursuit of knowledge induced him to seek every means of extending the sphere of his observations. In 1815, when commanding a frigate on the East India station, he accompanied Sir Samuel Hood, the admiral, in a journey over the greater part of the island of Java. Soon after his return to England, he was appointed to the command of the Lyra, a small gun-brig, in which he accompanied the expedition which took Lord Amherst as ambassador to China. While the ambassador was pursuing his journey inland to Peking, Captain Hall in the Lyra visited the places of greatest interest in the adjacent seas, and on his return to England in 1817 he published 'A Voyage of Discovery to the Western Coast of Corea, and the Great Loo Choo Island in the Sprue Sea.' In 1819 he accompanied the expedition of the Great Eastern, which contains charts and various hydrographical and scientific notices. A second edition was published in 1820, in which the scientific details are omitted; and in 1827 the work appeared in a still more popular form as the first volume of 'Constable's Miscellany.'

In this edition there is an interesting account of Captain Hall's interview at St. Helena with the ex-Empress Napoleon. Josephine (Captain Hall's father) had been the emperor's fellow-student at Brienne, and was the first native of Great Britain whom the Empress recollected to have seen. Captain Hall was next employed on the South American station in command of the Conway. The period was one of great interest to the Spanish colonies of South America.

Halo is a circular band of faintly coloured light which is occasionally seen around the sun or moon by observers on the earth. It has been observed to the distance of 22 or 23 degrees, measured on a great circle passing through the luminaries. The colours of the solar halo are such as are observed in the rainbow, but they are less bright, and they do not always, in the halo, follow the same order as in the bow. Generally the red is nearest to the sun, the exterior of the band being a pale indigo or violet, and sometimes white; but occasionally the interior edge appears to be white, which is succeeded by yellow, and then by green, yellow, and a red pale. The lunar halo in general appears to be white, but it is at times tinted with pale green or red. Often observed on the moon, the halo is double, consisting of two rings, one being broader and lighter of the two. The distance of the inner from the outer band is about 6 degrees.

When a mist or thin cloud is between the sun or moon and a spectator, there is frequently observed an ill-defined circle of coloured light immediately surrounding the disk of the luminary: this is called a coronal, or sometimes a halo. A solar corona is observed, for instance, when the rays of the sun's surface are observed through a cloud of gas or smoke. The corona is a ring of light which is more or less bright and is usually white, but it may be yellow, orange, or red. The corona is usually observed in the form of a series of bright spots or points, called the corona rays, which extend in all directions from the sun. The corona is most easily seen when the sun is low in the sky, and is best observed through a telescope. The corona is usually observed in the form of a series of bright spots or points, called the corona rays, which extend in all directions from the sun. The corona is most easily seen when the sun is low in the sky, and is best observed through a telescope. The corona is usually observed in the form of a series of bright spots or points, called the corona rays, which extend in all directions from the sun. The corona is most easily seen when the sun is low in the sky, and is best observed through a telescope.
Englefield. The sun being about 14 degrees above the horizon, portions of two halos were seen, one at 24 degrees, and the other at 48 degrees from it; the interior portion was of a pale yellow, and a degree broad; and the other, which was about 14 degree broad, was tinted with prismatic colours, the red being nearest to the horizon. On the left and side of the interior ring, and in a line imagined to be parallel to the horizon,

was a faint parhelion; and vertically above the sun, in the same ring, was a very remarkable parhelion rather brighter than the true sun: it had a pearly appearance, was ill defined, and about 14 degrees in breadth. From the ring, a small tract of the sky: the parhelion with its curved prolongations is said to have had very much the appearance of a vast bird hovering over the sun.

The last figure is a representation of a great double halo which was observed by Captain Parry: in this, a horizontal circle of light, at the intersections of which with the interior halo were parhelia, passed through the true sun; and there were segments of circles both at the upper extremities of the two halos and at the lower extremities of the exterior one, the latter being incomplete. The altitude of the true sun was about 20 degrees; and the radii of the inner circles were, respectively, 224 degrees and 46 degrees. The lowest parhelion was very bright, but had no colours, while all the segments were strongly tinted with colour. Above the sun, at about 26 degrees from it, and between the two halos, was a small portion of a third halo, which appeared to be elliptical; and the space between the two segments was extremely brilliant, in consequence of strong refractions of the sun's rays through the first. The sun was far in the sea.

In the tropical regions coloured halos are frequent and brilliant; and, near the equator, Humboldt has observed small clouds surrounding the planet Venus.

The chain of phenomena which has been given of the halo by Mariotte and Dr. Young, is nearly as follows:—Between the spectator and the sun innumerable crystals of snow or ice, having the form of equilateral prisms, may exist in the air, in all possible positions: of these probably one half will be so situated as to be incapable of transmitting any refracted light to the eye, but vast numbers may have their transverse sections in planes nearly passing through the sun and spectator; and it is to follow (the position of the last-mentioned year Hevelius observed also a halo with two parhelia and a double corona about the body of the moon. Dr. Halley observed a halo with parhelia in 1703; and a very remarkable one was seen by Sir Henry Englefield at Richmond, in 1809 (Journal of the Royal Institution, vol. ii.).

Besides these, many such phenomena have been observed in Europe, in the United States, and in Canada; and Captain (Sir Edward) Parry observed and measured several during his voyages to the arctic regions.

The first of the subjoined figures is a representation of the phenomenon observed, as above mentioned, by Sir Henry
conspicuous mass: there is material for an excellent historical portrait gallery in the present scattered about in the thirty-one apartments which compose the gallery. In their present scattered condition, their pictorial value is the chief attraction of these portraits, and this, in most cases, is so slight that they arranged according to their ages and characters, they would obviously have a great historical interest for multitudes who would scarcely glance at them as mere paintings.

The old royal collection of Hampton Court was a comparatively small collection; but it contained a large proportion of interesting works, including many that were in the collections of Charles I. and James II., of which some still remain; but the greatest credit belongs to George IV., when that palace was repaired and enlarged by Sir Jeffrey Wyatville in 1828. The original collection of Charles I. consisted of 593 pictures, which were valued at 4674. 10s. by the appraisers of the Council of State previous to the sale of Charles's effects. Charles possessed altogether 1887 pictures and 399 pieces of sculpture, which were valued by the same party at 81,915. 12s. and 17,800. 10s. 6d. respectively. (A Catalogue and Description of the First Capital Collection of Pictures, &c., London, 1767.)

The following are the principal works of the present collection at Hampton Court:

1. The Guard Chamber, containing numbers 1 to 17 inclusive: Zuccheri's portrait of Queen Elizabeth's giant porter who was seven feet six inches high.

2. The King's first Presence Chamber. Queen Elizabeth's State Apartments, by Kneller, known as the Hampton Court Beauties; a wooden Equestrian portrait of William III., by Kneller; an excellent portrait of the first Marquis of Hamilton by Mytens; an extravagant allegorical satire which, though founded upon the story of Scolen (ANTIPHILUS, P. C. S.), is not painted from his description of the picture of Apelles of Ephesus; a portrait by Dobson, and one by Hollar; an Italian lawyer by Borelone, and a portrait by Titian, both good pictures; a well-painted picture of the painter De Bray and his family, by himself; and a copy of a Venus by Titian, in the Pitti Palace, attributed to Titian; and there are also several other portraits and hunting pieces which are attributed to great masters, particularly a Man showing a Trick, attributed to Da Vinci, which is evidently not by that master. 3. The second Presence Chamber, 62-106, contains an admirably painted picture described in the catalogue as 'The Sculptor Baccio Bandinelli, by Correggio;' but the head is not like the authentic portrait of Bandinelli, and the painting, though in the style of Correggio, is more probably a later imitation; a finely-painted head of Alessandro de' Medici, by Titian; a copy of a large picture at Windsor of Charles I. on horseback, by Vandyck; a copy of Sir J. Reynolds, by St. John Street; a portrait of a gentleman, by Vanderbeest; Christian IV., King of Denmark, by Vansomer; and Philip IV. and his queen, two portraits by Velasquez. 4. The Audience Chamber, 107-149, contains five Scripture subjects by Holbein, the head of a woman elevated in sentiment and beautiful in colour; Ignatius Loyola, by Titian, a very sinister-looking countenance; a portrait of the Queen of Bohemia, the daughter James I., by G. Houbraken; and several bad pictures attributed to great masters, especially a Venus and Cupid said to be copied by Rubens after Titian. 5. The King's Drawing-room, 150-175, contains the Carnaro Family, by Old Stone, after the original by Titian in Northumberland House by Joseph and Potiphar's wife, by Gentleschi; and the family of Pordenone, by himself, an extremely bad composition. 6. King William III.'s Bed-room, 175-206. In this room are the beauties of the court of Charles II., or the Windsor Beauties, painted chiefly by Lely: as pictures, they are dry, cold, monotonous and formal, and as portraits, so much alike that it is difficult to believe in a resemblance to the originals: the Duchess of Portsmouth, by Gasser, has a very different physiognomy from those by Lely, which are absolutely void of individuality; of Lely's the best in the room is the Princess Mary as Diana. 7. The King's Writing-Cabinet, contains a portrait of the queen of Charles I. 10. Her Majesty's Gallery, 272-448, contains many old portraits, some of which are among the historically most interesting and printed works in the collection. 8. The Museum, by Hollar and others, though all the pictures attributed to Holbein in this gallery are certainly not by that master: the best works of this room are the children of Henry VIII., by Mabus, painted in 1495: and the portraits of
Every facility is afforded for students desirous of copying in the gallery; but permission must first be procured from the Chief Commissioner of her Majesty's Woods and Forests, or of the Deputy Surveyor; for without permission no person is allowed to make even the slightest sketch in a picture-book, or in any way to make a record of what he has seen; an injurious and extremely absurd regulation; for if an artist should wish to sketch a Tudor ruff, or a Stewart tie, or any thing else of so much importance, he must first forward a petition to her Majesty's Chief Commissioner of Woods and Forests.

Hampton Court is a very favourable resort in the summer; there have frequently been as many as 5000 visitors in a single day, as may be seen from the fact that 50,000 peacocks are bred there. There are catalogues also in Mrs. Jameson's 'Hand-book to the Public Galleries of Art in and about London'; and in 'The Enquiries of London,' by John Fisher Murray.

HANDWRITING, PROOF OF. [Evidence, P. C.]

HABEDELL, [Campanula, P. C. S.]

HARLOW, GEORGE HENRY, was born in London in 1787. He was the only son of his parents; his father, who was a merchant, died while he was an infant, and he was brought up by his mother, who watched with interest and anxiety the early development of her son's talent for drawing. He had little education. He was a fine artist at about seven years old; and when about sixteen he was placed with a Flemish landscape painter of the name of De Cort, whom he left for the late Mr. Drummond, A.R.A., the portrait-painter; and he was afterwards with the late Mr. Robert Smirke, R.A., of the church at Latymer, in Greek Street, with the privilege of copying pictures there, from nine until four o'clock, but with an especial proviso that he should receive 'no instruction of any kind.' Harlow had the privilege of setting up his easel whenever he pleased, except the expiration however of a year and a half, the master and pupil quarrelled. Lawrence used to employ Harlow to dead-colour, and Harlow had so far a share in painting a much admired daguerreotype of the author, which, as the Angerstein's, had the impropriety to claim as his own. This came of course to the ears of Lawrence, who, in consequence said to his pupil, 'As the animal you claim is among the best, and as this is the beginning of the matter, I will give you further instruction from me. You must leave my house immediately.' Harlow has the credit of having reversed Lawrence's resentment by painting a caricature of his style, upon a sign-board at Epsom, in one corner of which he wrote, 'T. L., Greek Street, Solo.'

Harlow, however, had little need of any man's assistance or instruction; he possessed a fine feeling for colour, a tolerably correct eye for form, and great facility of execution, especially in portraiture in small, whether in pencil, crayons, or oil-colours; and he was the rival of Lawrence at the age of twenty-two. He never studied at the Royal Academy; he never exhibited a picture there, as he had no money to pay the necessary subscriptions. He was a pupil of Mr. West, and to a certain extent of Sir Joshua Reynolds, whose father he did not know, Fussell's biographer; it is a work of the highest merit in every respect. The portraits of Northcote and Nollekens are also among his best works.

Having already obtained a considerable reputation and some means, Harlow set out, in June, 1818, upon a visit to Rome, where he attracted great notice and excited some wonderment by completing an effective copy of the Transfiguration, by Raphael, in a single month. His Diary—'I then leave the world can show nothing nobler of the kind than the stories of Abraham and Tobit.' They were estimated in the parliamentary inventory at 800l. ; but they were reserved by Cruikshank, who bought them, while he is told in ten other apartments, eight of which are in the hall, and two in the public dining-room (14), where there is also a tapestry of Tobit, with the angels, taking leave of his father Tobit, and his wife Anna, on his journey for the Levant. In the large apartment next to the hall, called the Waiting-drawing-room, are some much older tapestries, in a barbarous style of composition; their subjects are allegorical, but the colours are so faded that their value is uncertain. Above the draperies are scenes from some of the frescoes painted by Cignani: they are the cartoons of some frescoes painted by him in the ducal palace at Parma.
HAMPDEN, a genus of fossil Crustaceae (Trilobites), from the Devonian strata.

HARRIS, M., EARL OF, P.C. S. ("Travels in North America," vol. ii. p. 136.) Harrison of Chester, although he was not a native of that city, for he was born at Wakefield in Yorkshire, in 1744. While yet little more than a mere lad, he was sent to Italy, then considered almost the only efficient school for architectural study; and during his stay at Rome, where he remained for several years, he made designs for improving and embellishing the Piazza del Popolo, which obtained for him both a gold and silver medal from Pope Benedict XIII, and he was also complimented by being elected a member of the Academy of St. Luke. On his return, one of his first works was a bridge of five arches over the Lune, at Lancaster, at which place he was subsequently employed upon various alterations and improvements in the castle. At Chester, he erected the gaol, and the county courts, which last was considered at the time a very fine and correct specimen of the Grecian Doric style, and the portico erected over the entrance to the building. In that year he commenced the columnation, for though only hexastyle, it has twelve columns, there being a second row of six columns behind those in front. He also erected several works at both Liverpool and Manchester; in the former place the Exchange, and in the tower of St. Nicholas' church; in the latter, the Exchange buildings (since greatly enlarged and altered), the theatre (burnt down in 1843, and now succeeded by the new structure by Messrs. Irwin and Chester, opened September 29, 1845), and the library and reading-room called the portico. The Hill column at Shrewsbury, the triumphal arch at Holyhead, and the jubilee tower erected on Moel Famau in commemoration of the fiftieth year of the reign of George III. are all by Harrison. He also built for the Earl of Elgin his new mansion of Broome Hall, in Scotland, in the Grecian Doric style, which seems to have been equally the favourite one of his noble employer and himself. Cumberland in his "Observer" has complimented Harrison in very high terms for the pure classicality of his taste.

Harrison died at Chester, March 29, 1829. HARRISON, WILLIAM HENRY, late President of the United States, was born in Virginia, 9th February, 1773. His father was Benjamin Harrison, who was a member of the first Virginia House of Delegates. Phillip Melancton was one of those who signed the Declaration of Independence, and was afterwards governor of Virginia, his native state. He died in 1791. William Henry was educated at Hampden Sydney College, where in 1794 he became a member of the class of 1794; but soon after the death of his father he joined a force which was raised to defend the Ohio territory against the Indians; and the next six years of his life were spent in military service. In 1798 he entered West Point Military Academy. He was an officer of artillery; he was soon after raised to the rank of lieutenant, and in that capacity he was present and distinguished himself at what is called the battle of the Miami, in which a signal victory was obtained over the Indians. After this he was placed in command of Fort Washington, one of the most important defences of the western frontier. In 1797, this war having been brought to an end, he resigned his commission, and in 1798 was appointed secretary and ex officio lieutenant-governor of the north-western territory, then comprehending the whole country to the north-west of the river Ohio. In 1799, when the north-western territory was admitted to what is called the second grade of territorial governments, entitling it to a legislative body composed of representatives chosen by the people, he was elected a member of the territorial congress. In 1801, when Indiana was erected into a territorial government, Harrison was appointed governor, and this situation he appears to have held till the erection of Indiana into a state in 1816. He greatly distinguished himself both in the war with the Indians and the war with the British, in 1812, and in the English conquest of Canada in 1812 and 1813. In both these wars he held the rank of a general. In 1816 he was returned to the House of Representatives as one of the members for Ohio. In 1828 he was a member of the United States Senate, and all these military and civil services General Harrison had acquired great popularity; and in 1840 he was elected president; but he died, at the official residence in Washington, on the 4th of April, 1841, being the first president who had not been a public servant and an able man; but he did not belong to the same class of minds with his predecessors Washington, Adams, Jefferson, and Madison. In his Essay on the Aborigines of the Ohio valley, which was published in the "Transactions of the Literary and Philosophical Society of Ohio," vol. i. 1829, he has made some interesting remarks on ancient Indian mounds and on the original state of the forests of America. (See Lyell's "Rift of the Earth," vol. i. p. 43.)

HARTSHORN, SPIRIT OF. [AMMORIA, P. C. S.]

HARTSOCKER, NICOLAS, a Dutch natural philosopher, was born at Grono in 1664; his father, who was a minister of the Reformed religion, intender that he should enter the church as a profession; but a taste for the sciences, which the youth early evinced, prevented this intention from being carried into effect.

From the money which was allowed him by his father, young Hartsoeker saved enough to pay the fees of a teacher of mathematics; and he passed the greater part of each night in studying the subjects connected with the instruction which he received by day.

An accidental circumstance is said to have directed his attention to the construction of optical instruments: having presented a flower to a friend, it happened that she examined it, and was surprised to observe that the extremity, when milled, assumed a spherical form; and he immediately conceived the idea of using such spheres for the formation of a glass eye. It is said, on account, which he published in 1678, of the instruments thus formed, he asserts that he discovered the animals which exist in animal fluids [Levensschop, P. C.]; and, with the like instruments, Letort is said to have, first, perceived the red globules in blood.

In 1674 Hartsoeker was sent to pursue his theological studies at Leyden; and, in that city, he became known to Huyghens, who encouraged him in the prosecution of his microscopical observations: the two philosophers subsequently went together to Paris, where Hartsoeker was introduced to Cassini, who recommended him to exercise his ingenuity in the formation of object-glasses for telescopes; and it appears that, after several fruitless essays, he succeeded in obtaining some which were superior to that which had been before executed. These were of about 600 feet focal length; and in order that they might have truly spherical forms, he first, by means of sand, made a very shallow excavation in a plate of glass; then giving, by the like means, a slight convexity to one side of the plate of which the intended object-glass was to be formed, he ground the convexity of the other, and, by friction, brought the contiguous surfaces of both plates to equal and consequently spherical figures. In 1694 he published his "Essai de Dioptriques; ou, Traité des lentilles..." (Paris, 4to.) in which he attempted to give a general theory of the laws of nature respecting the hardness, elasticity, transparency, &c. of bodies. These subjects were, afterwards, explained in detail in his "Principes de Physic," which he published in 1696.

The work was criticised by a writer in the 'Journal des Savans,' in the same year; and Hartsoeker seems to have revenged himself by making a violent attack on the "Mémoires de l'Académie des Sciences." The attack, however, remained unnoticed. It appears to have been the character of Hartsoeker to seek occasions of entering into discussions with his friends; and if he, at length, lost the good opinion of the patient Leuwenhock by urging captious objections to the results of some of his experiments.

Having become embarrased in his circumstances, Hartsoeker was obliged, in 1696, to quit Paris: he retired to Rotterdam, where he published the work above mentioned; and he afterwards removed to Amsterdam. At this time he was introduced to the Czar Peter, then travelling inognit, and he was appointed to give the emperor lessons in natural philosophy. His conversation was so agreeable to the Czar that the latter invited him to Russia. Hartsoeker however declined leaving Amsterdam, and the magistrates of the city built for him an observatory in the basement of the English Consulate. The Elector Palatine having repeatedly offered Hartsoeker the place of professor of mathematics and philosophy at Düsseldorf, he at length accepted it; and, in the year 1704, he went to reside in that town. During the years 1714 and 1715, he made several journeys to different parts of Germany in
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order to visit the learned men of the country; and at Han-ower he was presented to the elector by the celebrated Leib-ningen. On his return from Duke's Court he caused three burn- lises similar to those of Tachinhauen to be executed. On the death of the Elector Palatine, Hartsocker, declining the solicitation of the Landgrave of Hesse-Cassel that he would resioved to Ulm, where he died in 1725. He had been a admitted a foreign associate of the Académie des Sciences of Paris in 1699; and he was also a member of the Academy of Berlin.

The Abbé Hautefeuille, such is his designation, devoted himself to the study of subjects connected with physical sci- ence, and to the construction or improvement of instruments; but he is distinguished chiefly by the claims which he ad- vanced in the honour of restoring the balance for watches. This contrivance consisted of a straight spring of steel which he applied so that it served to regulate the movements. About the same time Huygens invented, for the like purpose, a form of pendulum of a different kind: it happened however that Hautefeuille had communicated his invention to the Académie des Sciences of Paris in the preceding year; therefore when Huygens applied to the French Government to be allowed the exclusive privilege of using it, he was opposed by Hautefeuille, and he subse- quently withdrew his application. It is remarkable that Dr. Hooke had, about the year 1658, invented a balance-spring for watches, but he spent several years in improving his escapement, and his watches were not made public till about the same year that the inventions of Hautefeuille and Huygens were in use in Paris.

In 1735 Hartsocker published a work entitled 'Recueil de plusieurs Travaux de Physique, ou l'on fait principalement voir l'Exactitude du Système de Newton.' He also caused a letter to be printed in the 'Journal des Savans,' containing some absurd remarks on the hypothesis of the English philosopher. He treated Leibnitz no better, attacking with great violence his system of philosophy, and of a general kind. He would never admit the advantages of the 'Intuitionnal Calculus,' and persisted in considering it as an unintelligible jargon by the aid of which certain learned men sought to in- crease the simplicity of the sciences. He despised the moderns; as a superficial and an arrogant man; but his violence is sup- posed to be less owing to envy than to a morbid taste for disputation.

HARTZ. [GERMANY. P. C., p. 186.]

HASSELOQUISTIA, a genus of plants named by Linnaeus in honor of Fred. Haselequist, M.D., his pupil, who trav- eled in the Holy Land. It belongs to the natural order Umbelliferae, and to the tribe Tordyliaceae. The species closely resembles those of Tordylium, and are regarded by some botani- stis as monstrous forms of this genus.

HAUGHTON, WILLIAM, a dramatic writer, was prob- ably somewhat the junior of Shakspere. In Hemans's Diary, under the date of November, 1867, he is called 'Young Haughton;' and his name occurs frequently in that curious record, till the end of the year 1860, but not later. In March, 1869, Hemans lent him ten shillings to pay a debt, for which he then lay in the Clink prison; and constant ad- vances of small sums, in earnest of the prices of dramas which he was writing for the old manage, show him to have been as poor or improvident as most of his fellow-playwrights. He wrote several plays unamused; in others his coadjutors were Chettle, Day, and still more frequently Dekker, with whom he was in the habit of having strong and particular quarrels. In 1600 there was licensed a tragedy of his, not preserved, called 'Ferrex and Forrex;' and Mr. Collier has conjectured that Haughton's 'Devil and His Dam,' described as in 'Two Parts,' was not, as some suppose, an alternate title of 'Grim, the Collier of Croydon.' The same critic is more confident in believing that 'The Spanish Moor's Tragedy,' for which, in February, 1600, Hemans wrote to Dekker, Haughton, and Day a payment of three pounds to account, was the wild tragedy called 'Lust's Dominion,' which was printed for the first time in 1657, and has been inserted (without reason) in the recent edition of Marlowe's works. But the only extant plays in which Haughton is certainly concerned are two. 1. He was sole author of the lively comedy called 'Englishmen for Money; or, a Woman will have her Will,' which (under the latter title) appears in Hemans's 'Diary' of 1600. It was printed in 1616, 1618, and 1631, and has been reprinted in a small collection called 'The Old English Drama,' 1880, 4 vols. 12mo. 2. Dekker, Haughton, and Chettle were jointly the authors of 'The Playhouse' at Stationers' Hall in March, 1600, printed in 1605, and reprinted from a very rare copy by the Shakespeare Society in 1841.

HAUTERVILLE, JEAN-Louis, a bottle mechanic, was born at Orleans, September 20, 1647. His father, who was a baker, being accustomed to supply with bread the master of the house at which the duchess of Bouillon then resided, pre- vailed upon the master to allow the youth to the notice of that lady. The duchess having considered him with that favor, an interview took place, when the lady was so well satisfied with

the young man that she engaged to pay the expense of his education; and, on his entering into the ecclesiastical state, she retained him as her chaplain. He never after quitted his benefactress, who conferred upon him several benefices, and at her death she bequeathed to him a pension.

The Abbé Hautefeuille, such as his designation, devoted himself to the study of subjects connected with physical sci- ence, and to the construction or improvement of instruments; but he is distinguished chiefly by the claims which he ad- vanced in the honor of restoring the balance for watches. This contrivance consisted of a straight spring of steel which he applied so that it served to regulate the movements. About the same time Huygens invented, for the like purpose, a form of pendulum of a different kind: it happened however that Hautefeuille had communicated his invention to the Académie des Sciences of Paris in the preceding year; therefore when Huygens applied to the French Government to be allowed the exclusive privilege of using it, he was opposed by Hautefeuille, and he subse- quently withdrew his application. It is remarkable that Dr. Hooke had, about the year 1658, invented a balance-spring for watches, but he spent several years in improving his escapement, and his watches were not made public till about the same year that the inventions of Hautefeuille and Huygens were in use in Paris.

The other attempts to improve the projects of Hautefeuille are numerous, but few of them appear to have been brought to perfection. He published in 1692, at Paris, a work enti- tled 'Recueil des Ouvrages de M. de Hautefeuille,' which contains an account of his improvement of the clock; an account of pendulums in which the weight was to be raised by the action of the atmosphere; a method of raising water by means of fired gun-powder; and an account of some improvements in telescopes in which the field of view was to be increased by means of a concave mirror; also some observations on machines for raising water; a de- scription of a pump which was to act without friction; and an account of a contrivance for mounting telescopes of great length.

Hautefeuille published a method of finding the declination of a magnetic needle (1685); an account of a magnetic balance (1702); with accounts of a micrometrical microscope, and of an instrument for observing the altitudes of celestial bodies. He also published, in 1719, a work entitled ' Nouveau Système du Flux et Reflux de la Mer,' in which the phenomena of the tides are made to depend upon a particular motion which he ascribes to the earth; but the best of his works is his 'Dis- certation sur la Cauce de l'Echo,' which had been read before the Academy of Bordeaux in 1718, and was published in that city in 1741.

Hautefeuille appears to have been in haste to publish his ideas as soon as they arose in his mind, without waiting to see their final perfection. His papers, however, are of his projects are rude conceptions which have not led to any object of practical utility. The opinion entertained of him by his countrymen is manifest from the fact that he was never admitted to the rank of the Sciences though he ardently desired that honour. He died October 18, 1754, being then seventy-seven years of age.

( Biographie Universelle.)

HAWKER. [PEDER, P. C.]

HAYMAN, FRANCIS, R. A., the best historical painter in England before the arrival of Cipriani, was born at Exeter about the commencement of the eighteenth century. He was the scholar of Robert Brown, and was in early life much employed by Fleetwood, the proprietor of Drury Lane old theatre, and by Titers, the proprietor of Vauxhall. He also made many designs for booksellers, the best of which are the illustrations to Sir Thomas Hales's Sciences though he ardently desired that honour. He died in 1776. (Edwards, Anecdotes of Painters, &c.; Somerset House, 1843.)

HEADBROUGH. [CONSTABLE, P. C.]

HEALTH, PUBLIC. [Public Health, P. C. S.]

HEARSAV. [Evidence, P. C. S.]

HEAT. [ABSTRACTION AND ABSORPTION OF HEAT, P. C. S.; Conditions of Heat, P. C. S.]

HEAT, ANIMAL. The conversion of the food of man and the higher animals into nutriment for the body is attended with changes which produce an evolution of heat, at which concludes an animal at a point above or below, according to circumstances, the temperature of the
medium in which it exists. The degree of heat possessed by animals not gifted with the power of locomotion is very small above that of surrounding media, and in this respect resembles the heat given off by plants. [TEMPERATURE OF PLANTS, P. C.] In proportion as animals possess the power of locomotion they evolve heat from their bodies. This arises from the fact that the more the organism is most exercised there is greatest demand made upon the nutritive processes going on in the system. We should therefore expect to find that the quantity of heat developed in the irrational animals was less than that in the vertebrate class. Infusoria are for a time capable of resisting cold; for when the water in which they are contained is frozen, the animalcules are covered to live in a little encased space where the color of its body prevents freezing. John Hunter found that various forms of Amoebula, as leeches and worms, and several of the Mollusces, exhibited temperatures higher than the surrounding media. As might have been anticipated from their activity, the insects of all the invertebrate animals exhibit the highest temperature. They have been lately the subject of experiment by Mr. Newport. He found that they possessed a temperature above that of the medium in which they lived, varying from 20° to 90°.

With respect to the temperature of the different tribes, Mr. Newport observes, 'Our previous observations lead us to anticipate the fact, that the volant insects, in their perfect state, have the highest temperature, while, on pursuing the inquiry, it is found that those species which have the lowest temperature are located on the earth. Among the volant insects, those belonging to Diptera and Hymenoptera are those which maintain the highest temperature which pass nearly the whole of their active condition on the wing in the open atmosphere, either basking in the face of day despoiling the blossoms of their honied treasures, or fitting wanly from flower to flower, and breathing the largest amount of atmospheric influence. Of these the hive-bee, with its long train of near and distant affinities, and the elegant and sportive butterflies, have the highest temperatures. Next to these are probably those insects that encompass the horns and waists, and others of the same order; and, lastly, a tribe of insects which have always attracted attention, and in general are located on the ground, but sometimes enjoy the volant condition—the ants, the temperature of whose dwelling has been found to be considerably above that of the atmosphere. Next below the diurnal insects are the crepuscular, the highest of which are the spiders and moths; and almost equal with them are the Melonothon. In insects which live in societies the temperature is still greater. Mr. Newport found that a bee's nest in a chalk bank had a temperature 14° to 16° above that of the atmosphere, and 17° to 19° above that of the bank.

Amongst the vertebrate animals, fishes and reptiles have the lowest temperature. Dr. Davy, John Hunter, and others have given the summation temperature of from 7° to 7° above the surrounding medium.

In man the temperature of the accessible parts of the body, as the mouth, axilla, &c., is usually between 97° and 98°. The temperature of the blood is found to have the following range, varying from 100° to 101°75°; in disease it rises to 106° or 10°. In healthy persons the temperature is said to attain its maximum during the day, and to fall from 1° to 2° during sleep. Dr. Davy has also found that the temperature of the interior of the body is 2° to 3° higher in tropical than in temperate climates. Most of the Mammalia have a higher temperature than man, and birds develop a greater quantity of heat than any other class of animals. This arises from the nutritional changes going on in the bird in order to support the enormous muscular power which it is compelled to exert during flight. The following is a table of temperatures, as given by Rapin and Pedemans, for several birds and Mammalia:

<table>
<thead>
<tr>
<th>Birds</th>
<th>Degree.</th>
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<tbody>
<tr>
<td>Bat (Vespertilio pipistrellus)</td>
<td>106 to 105</td>
</tr>
<tr>
<td>Squirrel</td>
<td>105</td>
</tr>
<tr>
<td>Sheep</td>
<td>104 to 104'</td>
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<tr>
<td>Ox</td>
<td>104 to 99</td>
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<tr>
<td>Rabbit</td>
<td>104 to 93'</td>
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<tr>
<td>Ant</td>
<td>103 to 88'</td>
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<tr>
<td>Cat</td>
<td>102 to 86'</td>
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<tr>
<td>Bat (Vespertilio noctula)</td>
<td>102</td>
</tr>
<tr>
<td>Dog</td>
<td>101 to 93'</td>
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<tr>
<td>Guinea Pig</td>
<td>100 to 92'</td>
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<tr>
<td>Hare</td>
<td>99 to 92'</td>
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<tr>
<td>Elephant</td>
<td>99 to 93'</td>
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<tr>
<td>Horse</td>
<td>99 to 97'</td>
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</tbody>
</table>

There is now no question that the cause of animal heat is the chemical changes which are going on in the nutrient fluid of the body. During the act of respiration a large quantity of oxygen gas is taken into the lungs, which is absorbed by the blood. In this fluid it meets the various compounds of carbon which have been taken in with the food; and the consequence is a union of the oxygen with the carbon, and the formation of carbonic acid gas, which is given out when the blood again reaches the lungs during respiration. When carbon and oxygen unite out of the body, heat is the result, and the same thing occurs when they unite in the body; and it is through the medium of this change that the bodies of animals are raised to a given temperature by the circulation of the blood through the system. It has been calculated that there is more oxygen absorbed than is given off, and the excess is carried out of the system in the form of carbonic acid. It is probable that this enters into combination with hydrogen and compounds of hydrogen, nitrogen, and carbon, and thus contributes to the raising of the animal heat.

This theory of animal heat explains many well-known phenomena; for instance, the slight independent warmth of the foetus, and of those young animals which are born in an imperfectly developed condition. The low temperature of persons with scorbutic constitution, where the blood is slowly and imperfectly oxygenated, and the cold experienced by aged and debilitated persons in whom a small quantity of blood circulates slowly; as also the increased temperature observed in persons labouring under attacks of inflammatory disease where the blood circulates rapidly, are also confirmatory facts. The phenomena also exhibited by the hybernation of animals are explained by this theory. During the period of hybernation, when the blood is circulating only slowly and respiration is almost suspended, and the oxygenation of the blood is feebly performed, the temperature of the animal is low. The observations of Pallus and others show that hybernation is prevented by a temperature of from 50° to 60°, whilst it is induced in those animals which exhibit it even in summer by the application of artificial cold.

The production of heat is also the cause of the mass of the globules of the blood and the rapidity with which they circulate. When there are few blood-globules the necessity for the absorption of oxygen is diminished in the same ratio, and the circulation becomes slower, and the contrariety is that there is heat less developed. On the other hand, blood containing an excess of globules, but which is circulated less slowly, develops less heat than blood which contains a smaller proportion of globules but which is more rapidly circulated; for more oxygen may be consumed in the latter than in the former case.

The metamorphosis of the blood and the general changes of matter lead to still another source of heat. It has been shown by Pouillet that all solid bodies, organic and inorganic, undergo an elevation of temperature when moistened with different fluids. In organic substances it may amount to from 18°. Since the action of heat is always effected through humid membranes, this source of heat must be regarded as of great importance, even if it be not actually identical with the catalytic metamorphosis of the cells themselves. (Simon.)

(Carpenter, General and Comparative Physiology; Simon, Medical Chemistry, by Day.)

HEBER, REGINALD. Second Bishop of Cutchwa, was born April 31, at Malpass, Cheshire, of which place his father was for many years co-rector. The family was of considerable antiquity in the county of York, and on the death of an elder brother without issue, the father of Reginald Heber succeeded him as lord of the manors of Marton, Yorkshire, and parson of the rectories there; and estates at Hodnet, Shropshire, which had come into the
possession of the family by intermarriage. By his first marriage, with Mary, co-heiress of the Rev. Martin Baylce, rector of Wretham, Suffolk, he had one child, Richard, who for some time was representative in Parliament of the University of Oxford, and is known as the author of a collection of Poems. On the second marriage, with Mary, daughter of Cuthbert Allanson, D.D., he had three children—Reginald, the subject of the present notice, Thomas, Cuthbert, and Edwin.

At a very early period of his childhood, Reginald Heber was remarkable for his piety and for his eager thirst for knowledge. An excellent memory enabled him to recollect the contents of a book he had read within a year of its publication. He gave early indications of his poetical talents, and at seven years old he had translated Phaedra into English verse. At eight he was sent to the grammar-school of Haverford under Dr. Kent, and in his thirteenth year he was placed in the school of a clergyman near London. He remained there about three years, and in November, 1800, was entered at Brasenose College, Oxford. In his first year at the University he gained the prize for Latin verse, the subject of his poem being on the commencement of the new century. In the spring of 1803 he wrote his prize poem, 'Palestine,' which has obtained a permanent place in English literature. His career at Oxford was a regular one, and he stood at the head of his class in all the branches of his studies. The modesty of his manners, his gentleness of disposition, and the charm of his conversation, his society was courted by persons of all ages. In his studies he evinced no taste for the exact sciences; all his mental powers were concentrated on literature. About the middle of 1805, in company with his friend Mr. John Thornton, son of the member for Surrey, he set out on a continental tour. They proceeded through Rottemberg, Hamburg, Amsterdam, and Prussia, and returned to England in October, 1806. In 1807, before he had obtained his degree of M.A., he took orders, and was instituted by his brother Richard to the family living at Houghton. In the same year he was called to the bar, and in '18 he commenced practice. He himself describes his situation in his 'Letter to a Friend,' written in '1808. 'Never however were the duties of a parochial clergyman discharged with more exemplary zeal and benevolence; and Heber's conduct in his parish has often been pointed at as displaying in the greatest perfection all the best characteristics of a Church of England priest. In April, 1809, he married Amelia, youngest daughter of Dr. Shipley, Dean of St. Asaph. While discharging the duties of his parish with so much cheerfulness he was ardently attached to the pursuits of literature. He was a frequent contributor to the 'Quarterly Review' from its commencement. In 1812 he commenced the preparation of the 'General History of the Bible.' In 1815 he published with much delight, but other duties compelled him to suspend this work, and no part of it was ever published. In the same year a small volume of 'Poems and Translations for Weekly Church Service' was published. 'Hyms,' with a view of improving the psalmody and devotional poetry used in churches, was also a favourite recreation. He was an elegant versifier, and continued to indulge his poetical talents even while engaged in visiting his diocese in India. He had a great distaste for controversial theology, and only once was engaged in a discussion of this kind, in reply to what he conceived were the unwarrantable imputations of a writer in the 'British Critic.' His life was diversified by an occasional visit to his friends in other parts of England, or to his father-in-law in Wales, and by correspondence with a few friends whose views were those of the High Church party and Tory party, but devoid of all bitterness. He was well content with things as they were, and apparently had no perception of those abuses which have been swept away within the last thirty years. In 1815 he received a call to be lecturer, and the subject he selected was 'The Personality and Office of the Christian Comforter.' In 1817, Dr. Lummore, the Bishop of St. Asaph, appointed Heber to a stall in that cathedral, at the stipend of a curacy in his diocese. In 1819 he edited the works of Bishop Jeremy Taylor. His other works consist of 'Parish Sermons' published at Hodnet; and Sermons preached in India. In 1829, he succeeded to the living of Llangollen, for which he had formerly been an unsuccessful candidate. On the 2nd of December, in the same year, his friend and connection, the Right Honourable Charles W. Williams Wynn, who was at the time President of the Board of Control, consulted him confidentially respecting the appointment to the vacant see of Calcutta, but did not offer him the appointment. There was every probability in fact that in the course of a few years Heber would have occupied that position, and the correspondence with the Bishop of London was not revealed to him. By an accident in India much trouble and anxiety were occasioned to his wife and child, but immediately after the second refusal he wrote (12th Jan. 1833) stating his willingness to go to India. He congratulated himself upon the fact that no work was now more congenial to him, and that prospect of usefulness in so grand a field as India overborne all pecuniary considerations, and they had no influence in determining his conduct when the proposition of going to that country was first made to him. Besides, he had often expressed his liking for such a sphere of action, and he had 'a lurking fondness for all which belongs to India or Asia.' On the 22nd of April he saw Hodnet for the last time, and after having been consecrated, he embarked for his diocese, June 16th, 1833. The Diocese of Calcutta extended at this time over the whole of India, and embraced Ceylon, the Mauritius, and Australasia. In India the field of the bishop's labours was three times greater, and the number of chaplains who constituted his staff in Bengal was fixed at twenty-eight, but this number was never completed, and of the number who were appointed several were on furlough. The Bishop of Calcutta had not the power on his own act to his own responsibility, and to write almost every official document with his own hand. On the 15th of June, 1824, Bishop Heber began the visitation of his vast diocese. He visited the United Provinces, the principal towns of Hindustan, and the ports of Bengal and north of Bombay, and after an absence from Calcutta of about eleven months, during which he had seldom slept out of his cabin or tent, he arrived at Bombay. The Journal which Bishop Heber kept during this visitation has been published in three octavo volumes, shows the extent of his observations on general subjects and the graphic power which he possessed of describing the novel scenes in which he was placed. From April to August he remained at Bombay to investigate and superintend the interests of the western portion of his diocese. On the 15th of August he sailed for Ceylon, and after remaining there some time he proceeded to Calcutta, which he reached on the 21st of October. If it had been possible to have educated his children in India, he was now prepared, he states, to end his days amongst the objects of his solicitude. In February, 1826, he left Calcutta for Madras to visit the southern provinces. On the 1st of April he arrived at Trichinopoly, and on the 5th, after investigating the state of the mission and confirming fifteen natives, on whom he bestowed the episcopal blessing, he returned to Calcutta. In the month of August, in which he was found dead about half an hour after dinner. Within less than three weeks he would have completed his forty-third year. The handsome, modest, and simple manner of his life, combined with his talents and attainments, had inspired veneration and respect not only amongst the Europeans but the native population of India. It was said by those who were capable of judging that few persons, civil or military, had undergone such much labour, traversed as much country, seen and regulated so much in so short a time. On the announcement of his death the most eminent men at each of the three Presidencies and in Ceylon united in showing their regret at the loss which they had sustained. At Calcutta it was agreed to erect in the cathedral a monument to his memory, which was carried out by Chantry. A monument, also by Chantry, was erected in St. George's Church, Madras, in testimony of the public regret. At Bombay it was resolved to establish, in Bishop's College, a memorial chair to the title of 'Bishop Heber's Bombay Scholarship.' Mural tablets were erected in the churches of Trichinopoly and at Colombo in Ceylon. His friends in England placed a monument in St. Paul's Cathedral, London. The Dean of the Dean of the Church of England, on the 19th of December, 1829, erected a magnificent monument to his memory, the inscription on which was written by Southey. (Life of Reginald Heber, by his Widow, 2 vols. 4to., London, 1830. This work contains Selections from his Correspondence and Speeches, and a Sketch of his Life by Walter Scott. Journal of his Tour in Russia, etc., and a History of the Cossacks. Last Days of Bishop Heber, by the Archbishop of Madras.)
HECTOR ('Hetor'), the greatest of the Trojan heroes who figure in our accounts of the Trojan war. He was the son of Priam and Hebe, and married to Andromache. The poet Homer hailed him as a "greater than the gods" and as a "single warrior whom Achilles himself dreaded to approach, but as a hero ennobled by all the more tender and humane virtues, so that it almost seems as if the poet had developed his character more with a view to more exalted deeds than those of the Achaians, exceeding Achilleus. Hector is the favourite of his parents, and himself a happy husband and father. The reader need only be reminded of the beautiful passages in the 'Iliad' (vi. 369 f.), where Hector, before going to battle, takes leave of his wife and child, and where (xii. 271), amid the lamentations of his parents, he prepares himself for the contest with Achilles. Wherever the battle is fiercest, Hector is foremost, and his ally, Daunus, the son of Ares (Mars) and Apollo, he fights most courageously against the bravest of the Greeks, as Ajax, Nestor, Diomedes, and Teucer. He was foremost among those who stormed the Greek camp, and advanced as far as the walls that were about the city, and when the Trojans came forward and drove the Trojans back to their city, but was slain by Hector. This calamity roused Achilles from his inactivity, and he, determined to avenge the death of his friend, sought Hector, who, though implored by his parents to save himself, resolved to engage with his enemy. Achilles thrice chased him round the walls of Troy, and finally pierced him with his great chariot of fire, as a token of his ability to do a deed of value; and Hector, after being shot, was dragged by the chariot and dragged to the camp of the Greeks; at the funeral solemnities of Patroclus, it was dragged thrice around his tomb, and then thrown away to be devoured by the dogs; but it was preserved, as it is said, when the Scyths appeared as a suppliant before him and begged for it. The remains of Hector were buried at Troy, where funeral sacrifices were offered to Hector as a hero; at a later time, however, his remains are said to have been conveyed to Thessalian, in pursuance of an oracle. (Pausanias, iii. 19. 9; ix. 18. 4.)

HEDJAZ. [Arabia, P. C. and P. C. S.]

HE'DYSARUM (from ἕδυσσαι, the Greek name of the Corydalis salviifolia) is a species of characters of the genus Nardostachys, in the order Leguminosae. It has 5-6 calyx, with the segments subulate and nearly equal; the corolla with a large vexillum, and obovate tegumen; keel much longer than the wing; the stamens diadelphous; the legumes of numerous flat oblong or lenticular 1-seeded joints, which are connected together in the middle, and therefore the fruits are convoluted in both sides. The species are herbaceous or sub-shrubby, with unguiculate pinnate leaflets, axillary, with simple peduncles, and bearing racemose spikes of large purple, white, or cream-coloured flowers. The old genus Hedyasarum has been subdivided into many smaller genera. The Saintfins [Saintfin, P. C. C.], H. oenophyllos of older writers, now forms the genus Oenothera, which differs from Hedyasarum in the legumes consisting of many joints, not of one joint, as in the last. (1.)

H. coronarium. French honey-suckle, has diffuse stems, the leaves with 3-5 pairs of elliptic or roundish leaflets, which are pubescent beneath and on the margins; the spikes or racemes are compact, of a very long duration, and twice the length of the calyx; the legumes glabrous, with 25 orbicular prickly joints. It is native of Spain and Italy. It has deep red or white flowers. In Calabria this plant grows wild in great abundant masses and horses and muleteers feed with it. It grows well in our gardens, but probably would not make a good field crop.

H. fruticosum has an erect shrubby stem, the leaves with 5-7 pairs of alternate elliptic obtuse leaflets, which are clothed with pubescence on both surfaces; the flowers few, disposed in spikes; the wings hardly longer than the calyx; the vexillum the length of the keel; the joints of the legume wrinkled; the nerves slightly echinate. It is a native of Siberia in sandy places. It has a pale purple flower, and a very handsome plant. Horses eat it with avidity, and it may be made useful in fixing sand, in which it grows readily. It has a himant stem. The leaflets oblong, clothed on both surfaces with cancellous pistil; the stipules sheathing; the joints of the legume transversely wrinkled and echinate. In late summer, it grows abundantly about the Saskatchewan, on the Eagle and Red deer hills. The flowers are large and of a red colour. This was described as a species of yellow by Sir A. Mackenzie, and named after him. The whole plant has a sweet taste. It is a common plant.

H. lineare is used in Cochins China as a stomachic, and H. alpinum is used in Siberia for the same purpose. The P. C. S., No. 88.

H. senecioide of Wildenow, now Ormocarpum senecioideum, has a root which is used in India as a tonic and stimulant. The H. albiata of Linnæus is the Albiata marroanae of recent botanists. The flowers are yellow, scented, and in sweet substance like manna. H. tuberosum of Roxburgh, Pueraria tuberosa of De Candolle, grows in the Cinar mountains. The roots are used by the natives as pottish for swellings of the glands, not even excepting Achilleus. Hector is the favourite of his parents, and himself a happy husband and father. The reader need only be reminded of the beautiful passages in the 'Iliad' (vi. 369 f.), where Hector, before going to battle, takes leave of his wife and child, and where (xii. 271), amid the lamentations of his parents, he prepares himself for the contest with Achilles. Wherever the battle is fiercest, Hector is foremost, and his ally, Daunus, the son of Ares (Mars) and Apollo, he fights most courageously against the bravest of the Greeks, as Ajax, Nestor, Diomedes, and Teucer. He was foremost among those who stormed the Greek camp, and advanced as far as the walls that were about the city, and when the Trojans came forward and drove the Trojans back to their city, but was slain by Hector. This calamity roused Achilles from his inactivity, and he, determined to avenge the death of his friend, sought Hector, who, though implored by his parents to save himself, resolved to engage with his enemy. Achilles thrice chased him round the walls of Troy, and finally pierced him with his great chariot of fire, as a token of his ability to do a deed of value; and Hector, after being shot, was dragged by the chariot and dragged to the camp of the Greeks; at the funeral solemnities of Patroclus, it was dragged thrice around his tomb, and then thrown away to be devoured by the dogs; but it was preserved, as it is said, when the Scyths appeared as a suppliant before him and begged for it. The remains of Hector were buried at Troy, where funeral sacrifices were offered to Hector as a hero; at a later time, however, his remains are said to have been conveyed to Thessalian, in pursuance of an oracle. (Pausanias, iii. 19. 9; ix. 18. 4.)

HE'MECK, or Heemskerck, Merten, a celebrated Dutch painter, who was born at Heemskerck, near Haarlem, in 1481; he was the son of a peasant farmer, Jacob van Car, and though he is known only by the name of his birth-place. Merten was employed by his father in common farm labour, which was particularly distasteful to him. He had given evidence of a natural bent, and his father, being of a more favorable to his plan of becoming a painter. As he was returning home one evening with a pail full of milk upon his head, lost in a reverie about his future prospects, he came unconsciously in contact with a tree and fell over it, and was left, as he fancied, with a notion that he may have seen his father hastening up to him with a stick in his hand. His mind was instantly made up; he fled to Delft, obtained admission into the house of a painter of the name of Jan Lucas, and he too did not become a painter. He studied afterwards with Jan Schoorl, at Haarlem, and his earliest works of distinction were painted in the style of that master. After painting for some years at Haarlem with great success, he set out, in 1552, for Rome, but before he left he presented the Painters' Company at Haarlem with a picture of St. Luke painting the Virgin Mary, a picture which is much praised by Van Mander, and he also lent his long preserved with great care at Haarlem. In Rome, Merten, known as Martin Tedesco, distinguished himself as an imitator of Michel Angelo; the jealousy of the Italians, however, forced him to return to his own country, after a stay of three years in Italy. When he arrived at Dordrecht, he had a narrow escape of his life, for he put up, by recommendation from Rome, at an inn, which turned out to be a den of murderers, in which many travellers had perished; the story is told by Van Mander.

Heemskerck's early admirers were not at all pleased with the new style which he imported from Italy; however he found many new admirers, and he executed numerous works in this new style, which his earlier master Van Eyck had introduced to the school of the Van Eycks; his style was simple, earnest, and in character natural; in his later paintings he imitated in a manner the antique and the cinquecento style of Italy, but his caricatured the antiques, and he left the defects of the modern. There are scarcely any works by Heemskerck now at Haarlem; some were carried to Spain during the Spanish war, and many were destroyed by the iconoclasts in the riots of 1566. There is a Last Judgment by him at Hampton Court, and there are several of his earlier works in the Pinakothek, at Munich, which, however, show that he was not one of the best of the Van Eyck school. He died very rich, and, though he was twice married, childless, at Haarlem, in 1574. The engravings after his works, by various masters, amount to many hundreds.

(Van Mander, Het Leven der Schilders, &c.; Schoopen der schilders, Johannes Van Eyck en syne Nachfolger.)

HEERE, Lucas DE, a distinguished painter and poet, was born at Ghent in 1554. His father, Jan de Heere, was a good sculptor, and his mother excelled in snuff painting. Lucas was placed with Frans Floris, after he had made sufficient progress with his father to benefit by the instruction of Floris.

He Heere painted in France; and he was in England in the reign of Queen Elizabeth, whom he painted several times. There is a flattering allegory of her by him at Hampton Court; it represents Elizabeth as queen, and two maidens of honour, coming into the presence of Juno, Minerva, and Venus; the first is put to flight, the second is astonishe, and the last blushes; this is partly accertained by the follow.
ng Latin verses, probably by De Heer himself, written on the frame:—

Juno potens scintilla, aeris cornuque Palus, 
vestitu onerata spectabilis, 
Adstit Elisabeth; Juno previsae refugii 
Vindex deaque, adspice, et petis Elidem.

In 1570 Lucas was employed to paint a gallery for Edward earl of Lincoln, lord high admiral, in which he was to represent the customs of different nations. For England, says Van Mander, he painted a naked man surrounded by all sorts of weapons and silk stuffs, with a pair of scissors and a piece of chalk; and when the admiral asked him to explain it, Lucas said that he could not paint the Englishman in any particular costume, as he changed it daily; therefore painted him with his shirt and hose on, left and right side, to make his own clothes. This however, as Walpole has pointed out, was not an original device; it is prefixed by Andew Bordae, or Andrea Perusinus as he called himself, to his "Introduction to Knowledge," with the following lines:—

I am an Englishman, and ask I stand here, 
Mooting in my mind what manner I shall wear.

The principal of Lucas's poetical works was the Garden of Poetry, 'Boomgaard der Poëzie'; he commenced also in verse the "History of the Painters," but this was lost. He died at Ghent in 1584: he used for a monogramm an E and J, and he used also sometimes the following moral anagram of his own name, "Schade leer a" (injuries teach you). De Heere's manuscript and the general Venetian collection form part of the library of Copenhagen, jointly with his friend Tyschen, a journal on ancient literature and art ("Bibliothek der alten Literatur und Kunst"), and had a great variety of old printed books, for the "Transactions of the Royal Society of Göttingen." His activity was astonishing, and, in addition to all this, he began about the year 1800 to study the history of the middle ages and of modern times, and also lectured upon these subjects with as much applause as he had before obtained by his lectures on ancient history. It is further worth mentioning that Heeren's activity as an author was always in the closest connection with that of a lecturer, and before he wrote a work on any subject he had at least once or twice lectured on it in the university. Hence he always appears a master of his subject, and was enabled to give to his productions that finish and perfection which makes them popular in the best sense of the term, and which is certainly a rare characteristic of German writers. A great work relating to the history of modern times, and which is thought by some to be the best of his productions, bears the title "Handbuch der Geschichte des Europäischen Staatsystems und seiner Kolonien," Göttingen, 1809; a fourth edition appeared in 1822. A work on the influence of the Crusades ("Sur l'Ifluence des Crusades sur le Croisement et le Trafic. Inser lambres," Göttingen, 1780), translated into English and Dutch, and some of them are still regarded as standard works of their kind. On the death of Eichhorn, in 1827, he undertook the editorship of the "Göttingische gelehrte Anzeigen," as professor of history in the university, and professional duties, took up so much of his time that he was unable to complete his great work on the politics and commerce of the states of antiquity, although considerable preparations had already been made for it.

Heeren's merits were universally acknowledged. The academies of St. Petersburg, Berlin, Munich, Stockholm, Dublin, and Copenhagen showed their respect for him by electing him a member. He was also a member of the chief societies of London and Calcutta. In 1837 or 1838 Heeren, in conjunction with Uerdt, formed the plan of editing a series of works, containing the histories of the states of Europe. The best historians of Germany were induced to write histories for the series. The whole is not yet completed, but among those works there are some of the highest eminence, such as Lapennberg's "History of the States of Germany," and "History of the States of Sweden." Heeren died at Göttingen, on the 6th of March, 1842.
HEGENSIS (Hyrcania), a Greek rhetorician and historian, was a native of Magnesia, and lived about the time of the historian Timaeus, that is, about 250. Respecting his life no particulars are known, but as an author he appears to have been admired in ancient times, though more for his bad than for his good qualities. Strabo (iv. p. 648) calls him the founder of that florid and inflated style of oratory which was afterwards designated by the name of the Asiatic; and this testimony is borne out by Cicero (Cat. Orat. Ixx. 67, 69) and others. Hegenisis himself pretended to imitate the Attic orators, especially Lysias. He seems to have been destitute of all the qualities required of an orator, and to have taken refuge in the device of distracting the hearers by a variety of anecdotes, in order to avoid expressing them. This we must conclude both from the opinions of ancient critics as well as from the few specimens of his oratory which have come down to us, and are preserved in Cicero (Cael. 105), Quintus Curtius (Historiae, lib. v. cap. xxii. 5), and others (Cicero, Orat. 95, 250). As an historian he appears not to have been much better than as an orator. The subject which he chose was the history of Alexander the Great, but that he had no notion of the dignity of history is evident from the specimens given by Dionysius, Phutius, and Plutarch (Alc. 3) and A. Gellius (ix. 14) does not appear to be much mistaken in classing him among those who, unconcerned about historical truth and credibility, were content only with interesting and incredible stories. (Compare Strabo, iv. p. 396; Longinus, De Sublim., 3; Theon, Progymnasm., 3; St. Croix, Examen critique des Historiens d'Alexandre, p. 47, &c.)

From this Hegenisis we must distinguish HEGESIAS the Cynricus philospher, who lived somewhat earlier, in the reign of Ptolemaus Philadelphus, and was a disciple of Parabataes. His doctrines, however, differed in several points from those of other Cynricans, and so much so that his followers were regarded as a distinct school, and are called as such Hegenisitici (Hegyenicai) in the main points they agreed with those of the Cynics. In the matter of the maintaining that pleasure was the great object of man's life; but Hegesias and his school went further; they denied that kindness, friendship, and benevolence had any independent existence, and the feeling of the want of them. Happiness, they said, is a thing impossible to attain, for our body is subject to many sufferings, and the soul suffers with it. Life and death are equally desirable; nothing is by nature either agreeable or disagreeable, but becomes so through the circumstances in which a man lives. A wise person therefore looks upon life with indifference, and regards nothing and nobody so much as himself, reducing everything to his own convenience. This miserable view of human life was somewhat softened and improved by Anniceris, the disciple of Hegenis. Hegenis wrote a work entitled "Alexiropoia," in which he introduced a person named Oched, who advised his friends to use death, as death was more desirable than life. He seems to have taught philosophy at Alexandria, but as in consequence of his doctrines many persons destroyed themselves, King Ptolemy Philadephus is said to have forbad him to teach to any more. (Diogenes Laer., vii. 86, 93-96; Cicero, Tuscul., i. 54.)

HEINRICH, CARL FRIEDRICH, a distinguished German scholar, was born on the 8th of February, 1774, at Mooschleben, in the principality of Mansfeld. His father was pastor. He received his first education at the Kloster-schule of Dondorf, and afterwards at the Gymnasia of Gotha, where he was graduated in 1791 in philosophy, law, and other eminent sciences. Heinrich had read the principal Greek writers, even before he entered the Gymnasia, and his intimate acquaintance with them caused him to be looked upon as a wonderful boy. In 1793 he went to Göttingen, where he became the favourite pupil of Heyne, who made him his tutor. In 1797 he was appointed librarian at the Academy of Breslau, and in 1801 he obtained the title of professor. Boettiger, the eminent archaeologist, persuaded him to take an interest in the theatre in Breslau, and he finally exerted himself to raise its character, but wrote several dramas himself, and in the end became one of the managers of the theatre. In 1804 Heyne procured him the professorship of eloquence and of Greek of the University of Kiel. Philological studies had been greatly neglected there, and Heinrich at first lectured to empty benches, but he soon attracted a great concourse of students. In 1819 he was invited to a professorship in the newly-established University of Halle, and accepted the offer, and henceforth continued to lecture there until his death on the 20th of February, 1838.

Heinrich was a very excellent Latin scholar, though his lectures on Latin authors were very unequal. The best were those on the Satires of Horace, Juvenal, and Persius, for he himself had great satirical talent; his explanations always excited a most lively interest, being seasoned with his own wit and sarcastic allusions. The philological seminary of Bonn was much indebted to his exertions; but his personal character was anything but amiable: he was whimsical, inconsistent, and not unfrequently malicious. He published few works, but all of them have great merit; the following is a list of them:—1. "Epimenides aus Creta, eine kritisch-historische Zusammenstellung aus Bruchstücken;" nebst Zwei kleineren antiquarischen Schriften. 2. "In an excellent essay on the life of Epimenides and the works attributed to him." 2. "Lycyrii Oratio in Leocratorem," Bonn, 1821, 8vo. 3. An edition of Cicero's "De Legibus," 1828, 8vo. 4. An edition of "De Publici," Bonn, 1829, 8vo. 5. "Ebeleides." He wrote further critical essays in several periodical works, and was one of the editors of Köppen's German Commentary on Homer, in 6 vols., Hanover, 1764-1769. In the year after Heinrich died his edition of Juvenal, for which all preparations were made before, was published by his son, Bonn, 1839, 2 vols. 8vo., which is the best edition of Juvenal that we have. (See Long, in the Classical Museum, vol. i. p. 359, &c.) An editorial of Perius, for which Heinrich had likewise left the MS. ready, was published by Otto Jahn.

NEUER NORDERNEY (Nordische Lübbeck und Schröder, London, in the Programme of the lectures in the University of Bonn for 1888.)

HELIANTHEMUM, a genus of plants named from δαία, 'the sun,' and άνθεμος, 'a flower,' because the flowers open with the rising of the sun, and fall with the setting of the sun in the evening. This genus belongs to the natural order Cinneas or the family of the Compositae, and is included under the genus Cistus, but they differ materially in their characters. There are about 150 species enumerated, which are distributed in various parts of the world; they are mostly found in the southern parts of Europe. They are very showy, and a few species possess any available property in the arts or medicine, but they are extensively cultivated on account of their very beautiful and ornamental character.

Helianthemum, an erect herbaceous plant with oblong lanceolate or linear leaves, the racemes without bracts, and the stigma subsessile. The flowers are yellow, with a deep red spot at the base of each petal. It is a native of France, Italy, Spain, Portugal, and Turkey, and is found in Anglesey and Jersey in Great Britain, but is a very rare plant.

H. canum, the Hoary Sun-rose, is distinguished by its shrubby appearance, without stipules, and having terminal branched racemes. The florets are yellow, and are found in May. It is a native of the south of France and Germany, and is rarely found in Great Britain.

H. vulgaris, the common Rock-rose, is a procumbent shrub, with stipules, branched racemes, the style larger than the ovary, and bent at the base. The flowers are yellow, and bloom from May to September. It is a native of Europe, and is found in dry hillsly pastures. There is a very beautiful variety with double pale yellow flowers, which is much cultivated by florists. The stem, if touched in the sunshine, spread slowly, and lie down upon the leaf.
Almost all the species of Helianthemum are elegant plants, of hardy growth, and easily cultivated. They grow best in a light sandy soil, and should be protected during the winter in a frame.


**HELIOTROPION** (from Ηλιοτροπιον, the sun, and τροπιον, a turning), a genus of plants belonging to the natural order Erythrocypreales, a sub-order with corolla, with the threads usually naked, but in some species bearing the segments of the limb furnished with a single fold or a tooth between each; the stigma sub-conical; the carpels 4, 1-celled, combined, clovened without any many-lobed receptacle. The species are annual or shrubby plants, with alternate leaves, and ciliate spikes of small blue or white flowers.

*H. Parviflorum*, Peruvian Heliotrope or Turnsole, has a shrubby stem, pedate oblong-lanceolate wrinkled leaves, terminal branched spikes; the tube of the corolla hardly the length of the calyx. The mouth of the corolla is intersected with five placentae of a purple-like colour with a greenish throat. It is a shrub, growing one or two feet high, and is much cultivated on account of the scent of its flowers, which resembles very much the smell of the vanilla. It is a native of Peru.

*H. Europaeum*, the European Turnsole or Heliotropes, has an herbaceous erect stem, with ovate flat-topped finely tomentose leaves, the lateral spikes solitary, the terminal ones confluent, the calyx spreading in the fruit-bearing state. It is a native of Europe and of the islands of the Archipelago. It has large white corollas with a yellow throat. This species is the *Heliotrope* of Dioscorides (t. 146) and of H. H. *Eupatorium*, the *Heliotropium*, the *Heliotropium*. Upwards of eighty species of this genus have been enumerated. They are natives of the warmer parts of Europe, Asia, Africa, and America, and are found in New Holland. They do not possess any active property.

Many other species besides those here described have sweet-scented flowers, and are cultivated on that account. Some of them are consumed in large quantities by perfume makers for the sake of their volatile oil. They are aromatic and also mucilaginous, and potlicace made of the leaves have been applied to acanthaceous and sclerousorous sores. It is supposed that the plant used for the cure of urchins, and called "Tververcia," belonged to this genus. In their cultivation the shrubby and perennial kinds will be found to thrive in any kind of rich light soil, and cuttings will root readily in sand under a hedge. Some species can be propagated from seed sown in an open border, while the typical annual species must be sown upon a hot-bed before being planted out.


**HELL, MAXIMILIAN**, a distinguished astronomer and member of the order of Jesuits, was born May 15, 1720, at Schemnitz in Hungary, and manifested, at an early age, a decided taste for the study of natural Philosophy and Astronomy. At twenty-five years of age he was employed as an assistant in an observatory belonging to the Jesuits at Vienna, and he was at the same time keeper of the museum of experimental philosophy which had just then been formed in that city. In 1746 he was made rector of an academy at Leutschau in Hungary; but this post he held only one year, when he returned to Vienna. Here he completed his theological studies, and filled a small number of places, which he had instructed in mathematics. He took orders in 1751, and after three years he obtained the rank of doctor, with an appointment to the professorship of mathematics at Clausenburg in Hungary. Having continued five years in that capacity, he again returned to Vienna, where he was established in an observatory which had been built in conformity to his own directions; and he held the appointment during the remaining years of his life. Besides his own observations, he was charged with that of giving lessons in mechanics; as, in England, about eighty years earlier, the first astronomer royal was required to teach the use of mathematical instruments to boys from the Royal Hospital: the German astronomer, however, gave the lessons only during one year, his time afterwards being fully occupied in performing services more important to science.

Through the mediation of Count Bacheho, who was sent from Copenhagen for the purpose of making the proposal, he accepted an invitation from the court of Denmark to undertake a journey to Wardhuya in Lapland, in order to observe there the transit of Venus over the sun’s disc. Accordingly he set out for Copenhagen in 1758; and, on the 3rd of May, the same year, at the time of the transit, he proceeded to the place of his destination: he was absent about two years and a half on that mission. On his return, having fully surveyed the state of the arts among them: he made also numerous observations on terrestrial magnetism, on the phenomena of the tides and winds, and on the variations of the barometrical column; and he measured the heights of the principal mountains. After his return he prepared a work containing a full account of his researches, which was to have been published in three volumes, 4to., but it never appeared.

Hell was very fortunate in the sky being favourable, on the day (June 3, 1769) that the transit took place, so that he was enabled to observe the interior contact at the commencement, and both the interior and exterior contacts at the termination of the phenomenon; and it is a proof of the accuracy of his observations that the value of the sun’s parallactic, which he deduced by comparing them with the corresponding observations at certain other places, agreed, within one-fifth of a second of arc, with the observed value, and with all the comparisons with all the best observations which were made.

On accepting the engagement, Hell was enjoined by the Danish ministry to abstain from publishing any account of his observations which was not required by the international correspondence. It was in this way that he only published the results of eight of his investigations, which were all the requisite computations. The delay, which, in consequence of this injunction, took place in making Hell’s observations public, gave offence to Lalonde, who had, by letters of recommendation to the governments of Europe, greatly promoted the measure of observing the phenomenon at different places on the earth’s surface; the two astronomers were however soon reconciled, and they continued to correspond with each other as before; and his memoir relating to the transit, which was read before the Academy of Sciences of Copenhagen, November 24, 1769.

The principal work published by this astronomer was a series of Ephemerides in thirty-five volumes, 8vo., the collection being entitled "Ephemerides Anni 1757—1791 ad Meridiam Vindobonensem Calculis Definitis." With the exception of two volumes, these constitute the astronomical works of this astronomer, who, besides his original investigations, had published a treatise on the theory of the moon (1777, 1779, 1781), and a work on the subject of navigation (1777, 1781, 1784). He also published a collection, which had been made by Hallstein, of the astronomical observations made by the Jesuits at Fekin from 1717 to 1725; this was published at Vienna, in 2 vols. 4to., in 1768.

Besides these works he published: "Elementa Algebræ J. Crivelli," 8vo., 1754; "Adjunctionem Memoriae Manuale Chronologico-Genealogico Historici," 16mo., 1750; "Elementa Arithmetica Numerique et Literarum," 8vo., 1763; also a tract on the construction of the naked eye, 1779; and one on a New Theory of the Aurora Borealis, 1776.

All his works were published at Vienna; and he died there, in that city, having finished seventy-two years of age. A brother of Hell was a distinguished mechanic at Schemnitz, and the inventor of a sort of siphon for draining mines: this is described in the "Memoires de l'Academie des Sciences," where the making celestial instruments was described.

(Biographie Universelle : Delambre, Hist. de l'Astronomie au Dixsième Siècle.)

**HEL, WIND, P. C.**

**HELINCHECORTON. (See Wicz, P. C.)**

**HELDOUS. (See Sessis, P. C. S.)**

**HELOSCIAD, a genus of plants belonging to the natural order Umbelliferae and to the tribe Aminaceae. It**
has a calyx of 5 teeth or obsolete; the petals ovate, entire, with a straight or curved apiculus; the fruit ovate or oblong; the seeds few, the testa of the seed obovate, subelliptic, with the testa occluding the apartment of the styles with single vitre, the carpophore entire. There are three British species of this genus. H. nodiflorum, with the leaves obtusely serrate; H. repens, with the leaves obtusely serrate; and H. innotatum, with the leaves of the lower leaves divided into capillary segments. The first is a native of brooks and ditches, and is frequently mistaken for the water-cress, H. natans. The second is a native of polystichum, and the third is a rare plant in Great Britain. The last species is found in ponds.

(Babington, Manual of British Botany.)

HELSTON, a market town and parliamentary and municipal borough, in the hundred of Kerrier or Kirrier, in the county of Cornwall, 296 miles south-west of General Post Office, London; viz., 197 to Exeter by railway, and from thence 98 miles by coach road through Ockhampton, Launceston, Bodmin, and Truro. Helston was made a borough by King John (A.D. 1201). According to Lysons, the townsmen paid him forty marks of silver and a palfrey that their town might be made a free borough. King Edward I., however, gave one of the coinage towns; and sent member to Parliament from his reign. There was a castle here in which Edmund, Earl of Cornwall, cousin of Edward I., resided at one time, but it was afterwards neglected that it was in ruins in the time of Edward IV.; and the town itself was in the reign of Henry VIII. one of the decayed towns for the repair of which an act of parliament was passed. The town stands on the eastern bank of a small stream, the Lo or Low or Loo which forms about a mile below the town a wide expanse of water called Lo-pool. The river Hel or Heyl, distinguished from another stream of the same name in the county, as the Heyl in Kierrow, and sometimes called the Helford, flows about two miles east of the town, or rather less. The streets are irregularly laid out; but are paved and lighted with gas, and the town presents a neat and clean appearance. The market-house and townhall are near the centre of the town, and the ancient coinage-hall stands at the end of a street to which it gives name. There are no remains of the castle. The Church dedicated to St. Michael is a modern building of white moorstone (granite), erected by the Earl of Godolphin in A.D. 1708. There is a baptist meeting-house and a Wesleyan chapel.

The population of the old borough and chapselly which has an area of 130 acres was in 1841, 3584; the number of houses was 763, viz., 682 inhabited, 66 uninhabited, and 15 building. The number of houses in 1881 was only 616, viz., 581 inhabited, 32 uninhabited, and 13 building; so that the increase of population in the ten years 1831-41 was 291; and the increase in the number of inhabited houses, 101. The town is the centre of an important agricultural and dairy district. In 1835 it had a population of 6572 on Wednesday and Saturday; and there are several fairs or great markets in the year. A great number of shoes are made in the town, and are sold at the markets and fairs; or are sent to and sold at London and other towns. The town is the seat of a new court of Quarter Sessions, held on the third Tuesday of each month. The Act returned two members, now returns only one; the old borough was, for parliamentary purposes, enlarged by the addition of the adjoining parish of Sithney and of a considerable part of the parish of Truro; but the borough is now in a prosperous condition, and we have no means of ascertaining the number of electors on the register in 1824-36, as 556, in 1839-40 it was 406, showing an increase in four years of 50 voters. The town is a polling station for the western division of the county of Cornwall. By the Municipal Corporations Reform Act, the borough has 4 aldermen and 12 councillors, but was not to have a commissioner of the peace except on petition and grant. The old municipal boundaries have not been altered. The living is a perpetual curacy united with the vicarage of Wendron, of which parish the chapel of Helston is a dependency; the church is the ancient one, the united bests in 1675, with a glebe-house: it is in the rural deanery of Kierrow, in the archdeaconry of Cornwall and the diocese of Exeter. There were in the chancel of Helston in 1833 two national schools with 190 children, viz., 127 boys and 63 girls, and five other day or boarding schools with 125 boys, 66 girls and 40 children of sex not stated, giving a total number of 599 children, or about one in eight of the population (according to the then recent census of 1831) under daily instruction. There were at the same time two Sunday-schools with 446 children, viz., 127 boys and 135 girls connected with the two dissenting congregations. (Lysons, Magna Britanniæ (Cornwall); Municipal Corporations Commissioners, Reports, Population Returns and other Parliamentary Papers.)

HELVELLA. [HYMENOPTERAE, P. C. S.]

HEMANS, Felicia Dorothea, was born September 25, 1794, at Liverpool, where the family name was Browne, was engaged in mercantile pursuits. He was a native of Ireland; her mother was an Englishwoman, but was descended from a Venetian family, through her father, who was commercial agent at Liverpool for the Venetian government. Felicia Dorothée Browne was the fourth child of a family of three sons and three daughters. About the year 1800 Mr. Browne, in consequence of the failure of a mercantile concern in which he was engaged, removed his family from Liverpool to an old mansion, spacious and solitary, called Grywyth, not far from Abergele, in Denbighshire, North Wales. Mr. Browne died not long afterwards. Felicia Browne began to write before she was nine years of age, and her mother, a woman of education and taste, was her first confidant and encourager.

Miss Browne's first volume of poems was published in 1808, and contains some verses written by her as early as 1803 or 1804. A harsh review of this little volume affected her so much that she was confined to her bed for several days. Her second volume, 'The Domestic Affections,' was published in 1812.

In 1812 Miss Browne became the wife of Captain Hemans, of the fourth regiment. His constitution had suffered so severely in the retreat upon Corunna, and subsequently by fever caught in the disastrous Walcheren expedition, that he felt it necessary, a few years after their marriage, to exchange his native climate for that of Italy. This at least is the motive assigned for his leaving his wife; but their union, it is said, was not happy, and this separation, which took place just before the birth of her fifth son, closed it for ever. Mrs. Hemans, with her five sons, went to reside with her mother, then living at Bronwynt, near St. Asaph, in North Wales. Mrs. Hemans now resumed her literary and poetical pursuits with increased ardour. She studied the Latin, Italian, Spanish, Portuguese, and German languages. She made some translations from Horace, Herrerius, and Camoens, and contributed a series of papers on Foreign Literature to the Edinburgh Magazine. 'The Restoration of the Works of Art to Italy' was written for a Taunt on the 'Lettres Historiques,' in 1819; and, about the same time, 'The Spartan,' a didactic poem, in heroic rhyme; and 'Modern Greece,' in ten-line stanzas. Her poem of 'Dartmoor' obtained the prize from the Boyce Society for 1826.

When about twenty-five years of age, Mrs. Hemans became acquainted with the Rev. Reginald Heber, afterwards Bishop of Calcutta, who passed a part of every year at Bodryddian, near St. Asaph, with whom she formed a lasting friendship. At his suggestion she wrote her first dramatic work, the tragedy of 'The Vespers of Palermo,' which was represented at Covent Garden Theatre, London, in 1823. It was unsuccessful there, but was afterwards better received at Edinburgh, when Walter Scott wrote an epilogue for it. 'The Siege of Valencia, the Last Constantine, and other Poems' was published in 1826.

In 1825 Mrs. Hemans was married, with her mother, her sister, and her own sons, to Rhyllion, near St. Asaph. Her sister had returned, in 1821, from Germany, where one of her brothers was attached to the Vienna embassy, bringing with her a fresh supply of German books, and Mrs. Hemans's delight in German literature may be dated from that time. Her 'Lays of many Lands,' most of which appeared in the New Monthly Magazine, then edited by Thomas Campbell, were suggested by Herder's Stammtische Abhandlungen, and, preceded by 'The Forest Sanctuary,' formed her next volume, published in 1827, which was followed, in 1828, by the Records of Woman. Most of these poems were written at Rhyllion, and many of her verses were written in the home of her brother, the melancholy occasioned by the recent death of her mother, for whom her affection was always exceedingly strong. In the autumn of 1830 her marriage of her sister, and the removal of her brother, who was going to army, in Ireland, Mrs. Hemans established herself at the village of Wavertree.
near Liverpool, in the expectation of obtaining good schools for her children and pleasant society for herself. She had little success in either of these objects. The schools were not such as she wished for; her house was inconveniently small; she could not attend the parties, regimented fashionability, and parties, and complains with some bitterness of ‘this weary celebrity.’

In the early part of the summer of 1829 Mrs. Hemans paid a visit to her friends in Edinburgh. She proceeded to Chiswick, in Roxburghshire, the residence of the author of ‘Cyril Thornton,’ and was there introduced to Sir Walter Scott, with whom she afterwards spent several days at Abbotsford. She returned to Edinburgh in August, and thence proceeded home to Wavertrie.

In 1830 she published another volume of poetry, ‘The Songs of the Affections,’ and in the summer of the same year paid a visit to the lakes of Cumberland and Westmorland. She remained a fortnight with Wortworth at Rydal Mount, and then took up her residence at Dove-Nest Cottage, near Ambleside. After remaining some weeks, she was induced to make a second visit to Scotland, on which occasion she spent the greater part of the time at Milburn Tower, the seat of Sir Robert Liston. During this visit she formed a friendship in consequence of which she was induced to visit Dublin before she proceeded to Wavertrie, and ultimately decided on leaving England, and fixing her abode at Dublin.

In the spring of 1831 Mrs. Hemans left England for Dublin, where she took lodgings. Her health, from the time of her leaving England, had been as rapid as the advancing age of the sons remaining under her care was an additional cause of anxiety. ‘My position,’ she writes, ‘obliged as I am to breathe a stormy world alone,’ precluded the formation of friends in Dublin, of which she had a great desire. In November, 1831, after a visit to her brother in Kilkenny, she writes thus to a friend in England:—On my return to Dublin I became a sufferer from the longest and severest attack of heart-ailment I have ever experienced. It was accompanied by almost daily fainting fits, and a languor quite insensible. And not long afterwards, in the same letter, she says:—The constant necessity of providing sums of money to meet the exigencies of the boys’ education has obliged me to waste my mind in what I consider mere desultory effusions.

Pounding myself away,
As a wild bird amid the foaling stars,
That which with him thrills and beats and burns
In a light of fire.

In January 1834 the latter months of 1833 were busily spent by Mrs. Hemans in arranging and preparing for publication the three collections of her poems which were published in the spring and summer of 1834: ‘Hymns for Childhood;’ ‘National Lyric and Sonnet;’ and ‘Muses of Life is a Mirror.’

In August, 1834, Mrs. Hemans took the scarlet fever, and when imperfectly recovered, caught a cold; and soon after her illness, she was declared to be in a state of critical illness. In November 1834 she was again taken ill of an illness which before November of 1834 had always been considered an unusually dangerous attack. The summer residence of the Archbishop of Dublin was placed at her disposal; change of scene and the kind attentions of the archbishop and his wife afforded some relief, but no permanent benefit; and in order to be near to her physicians, she was taken back to Dublin.

On the 26th of April, 1835, Mrs. Hemans dictated her last poetical effort, the ‘Sabbath Sonnet.’ She continued to sink gradually till May 12, 1835. She died, after a long and quiet sleep, without a sigh or movement. She was buried in St. Asaph Church, Dewar’s Brindley, Dublin, which is close to the house in which she died. A tablet erected by her brothers in the cathedral of St. Asaph, in memory of Felicia Hemans, whose character is best portrayed in her writings. A volume of ‘Poetical Remains’ was published after her death.

Mrs. Hemans could hardly be called a beautiful woman, but her personal appearance was very pleasing. In early youth she was noted for her graceful figure, the elegance of her complexion and her glossy golden hair; her complexion retained its clearness in her mature years; her hair darkened into auburn, of a silk-like softness, and very long and abundant. In her later years she became more something than usually delicate and coquettish. She was slight, graceful, and well proportioned and faultlessly into general society. Her family, a few friends, her music, her books, and her poetical pursuits, were her chief sources of enjoyment. She played on the harp and piano-forte, and about the time when she went to reside at Wavertrie, discovered in herself a faculty which gave her much gratification—that of composing melodies; she could sometimes be heard to revolve a theme or two in her mind for it, and sometimes set to music a song or a lyrical piece already written. Among her friends she was distinguished by much vivacity and a very delicate wit. She was kind and generous to her friends as to her enemies. She was not at all afraid of the world, and mixed freely and naturally with all classes of people. She was not at all afraid of the world, and mixed freely and naturally with all classes of people. Mrs. Hemans’s love of the art to which she had devoted herself was intense, and her appreciation of it was serious and high, as a means to purify and elevate the mind. In her later years her religious impressions became stronger, and her poetry became more tinted with religious thoughts and feelings. Her knowledge was extensive, but it was not philosophical or scientific knowledge. Poetry was the object of all her studies, and she sought for its materials in history, voyages and travels, and the fine arts; but her especial delight was to contemplate the scenes of nature in all their aspects of beauty, and to muse upon the associations and sympathies connected with them. Her thoughts are unreserved, are never vague or indistinct, and always seem to flow naturally from the scene or circumstance present to her mind. She is most successful when the subject is native, something which she herself has often experienced. She calls up the sympathies which are familiar to her. In foreign subjects she is less effective. Her poetry is thus peculiarly and strikingly the representation of her own character, of her thoughts and feelings of the moment. Her thoughts and feelings are lyrical and descriptive, filled with imagery, sometimes over-flowing with it. She has no dramatic power; she cannot enter into the thoughts and feelings of others; she can only exhibit her own. Her tragedy seems rarely consummated. The actions and sentiments of the characters are above nature or out of it, and the diction is not dramatic, but poetical, and monotonous and uniform from point to point. Her versification has three distinct styles. Her ‘Domestic Affections,’ and other early poems, are obviously modelled on ‘The Pleasures of Hope,’ of Campbell; her ‘Tales and Historic Scenes,’ and other poems of the middle period, are in the manner of Byron, less flowing than her early style, but more vigorous. Her last style is her own, and whetted in blank verse, in couplet rhymes, in stanzas, in sonnets, or in the varied measures of lyric poetry, and continuous and continuous flow a perfection of rhythmical melody which in sweetness and fullness of sound has never been surpassed. In uninterrupted reading, however, it has an effect of cloying uniformity. The style which she employs in her later works is light, graceful, and continuous and continuous flow a perfection of rhythmical melody which in sweetness and fullness of sound has never been surpassed. The eggs of Hemerobii are deposited on plants, and are pedunculated, so as to resemble fungi, for which they have sometimes been mistaken. These insects range from Europe to Australia, and there her results are not extensive native species. HEMICID/DA/RIUS, a genus of fossil Echionidicrana, from the oolite.

HEMIPNEUSTES, a genus of fossil Echionidicrana, from the chalk quarries.

HEMISTRYPA, a genus of fossil Polyporia, in the limestone of Devonshire, allied to Fennusthes. (Philippi.)

HEMIPRENATRICA [Mites], Hops, P. C. S.]

HENDERSON, THOMAS, was the son of a respectable tradesman at Dundee, where he was born December 28, 1798. After an education such as his native town could
The private character and social qualities of Mr. Henderson are among the pleasant recollections of those who knew him. In his astronomical career he resembled his friend Mr. Baily in bringing to the position of Astronomer Royal a mind as well fitted as his own for doing business. He was well acquainted with astronomical literature, and with other branches of science; and at different times supplied the places of the professors of mathematics and of natural philosophy in the Universities of Heidelberg and Berlin. He formed a great attachment to the methods of the German astronomers, and his models and works were MM. Besel and Struve. His determination to be well prepared for his work abroad made him collect an astronomical library which, for a man of his very limited means, was of extraordinary extent and goodness; and those who knew him remember the ready manner in which he could produce the results of his reading. Of his writings we may say, briefly, that, in addition to their valuable masses of observations, they abound in all that distinguishes the astronomer, properly so called, from the noter of phenomena.

HENRICO CATERINO DAVILA was born at Pieve di Sacco near Padua, was the son of Antonio Davila, who was a great constable of Cyprus when that island was taken by the Turks from the Venetians in 1671. He was the son of a navigator and the grandson of an officer in the service of Venice, who had relations, and afterwards to France, where he won the favour of Catherine de Medicis, and of her son King Henri III. Lastly he went to reside in the Venetian States, where a son was born to him. Mr. Davila's first work was the establishment of the names of Henrico Caterino, in homage to his royal French patrons. When Henrico was seven years old his father took him to France for his education. At the age of eighteen he entered the army under the command of Gascier, and, after five years, was severely wounded at the siege of Honfleur. In 1599 he was recalled to Pieve di Sacco by his father, who, soon after his return, died, and Henrico, unprepared for life by throwing himself out of a window. Not long afterwards Henrico entered the military service of Venice, and was employed successively in Candia, Friuli, Dalmatia, and other stations. In 1638 he was sent to take the command of the garrison of Crema, with or sans from the senate to the postmasters on the road to supply him with every convenience required for the service. On arriving at the stage of S. Michele, near Verona, the postmaster refused to furnish the necessary accommodations. High words ensued, and the postmaster fired a pistol, and shot Davila dead in sight of his wife and children. One of Davila's sons attacked the murderer, and killed him on the spot; others were wounded in the affray, and the chaplain of Davila was also slain.

Davila is known to the world through his History of the Civil Wars in France, ‘Storia delle Guerre Civili di Francia,’ from the death of Henri II. to the peace of Vervins in 1559, a period of forty years most eventful in the history of that country. He treats, therefore, upon the same ground as De Thou in his ‘Storia sui Tempori.’ Some critics have noticed that Davila’s history is less historical than dramatic, and especially for Catherine de Medicis, who had been his father’s benefactress. The facts, however, stated by Davila are acknowledged to be true, and he was well acquainted with them through his intimate acquaintance with his father. He was familiar with the politics of his age, and with the leading contemporary characters. He was also well acquainted with the topography of the places in which most of the events which he narrates occurred. His style is graphic and animated, especially when he describes a popular insurrection, a combat, or the storming of a town. His account of the massacre of St. Bartholomew may be read with the utmost satisfaction. Apostolo Zeno, comparing Davila with Guicciardini, observes, that whilst the prolixity of Guicciardini in dwelling minutely upon minor matters becomes wearisome to the reader, the course of Davila’s narrative runs on uninterrupted, adhering briefly to circumstances of subordinate importance, and dwelling chiefly upon those which have materially affected the interests either of religion or the state. By common consent Davila is numbered among the best historical writers of Italy. The bulk of his work has gone through many editions, and has been translated into several languages. Apostolo Zeno published a splendid edition of it in 2 vols. fol. Venice, 1735, to which he has prefixed a life of the author. (Tiraboschi, 'Storia della Letteratura Italiana; Corniani, 'I Soci di Quaella Letteratura Italiana.)

HENRYSON, Sir P.-s, a Scottish poet of much merit, lived in the latter part of the fourteenth century. Of his life hardly anything is known. He is supposed to have been the
Robert Henryson whose signature as notary-public is attached to a charter granted in 1478 by the abbot of Dunfermline, in Fifeshire; and he is elsewhere said to have been a schoolmaster in that town. It has been inferred that he must have been an ecclesiastic; and it has been inferred that he may have been a Benedictine monk. In a poem of Dunbar, printed in 1508, he is spoken of as dead: and in one of his poems he had described himself as a man of age. His tale of Orpheus Kyng, and how he went to Iverna and to hel to seek his quene was printed at Edinburgh, in 1508: and in 1568 there was printed his Testament of Faire Creseide, which had been suggested by the Troilus and Creseide of Chaucer, in the edition of 1568, in the common editions of that poet's works. His beautiful pastoral of Robin and Makynye is now known to most readers from Percy's Reliques. Other specimens of Henryson's poems are in Sibbald's Chronicle of Scottish Poetry, in Dr. Irving's Lives of the Scottish Poets, and in Ellis's Specimens. The fullest collections of them, however, are in Lord Hailes's Ancient Scottish Poems, 1770, and in a volume containing his thirteen poems, called Fablia, edited by Dr. Irving in 1834, for the Bannatyne club. For that club, in 1824, Mr. George Chalmers had edited the Testament of Creseide, and Robin and Makynye. Henryson writes with much greater purity and correctness than most Scotsmen of his time; his versification is good, and his poetical fancy rich and lively.

HEPATITIS. [LIVER, DISEASES OF, P. C.] A genus of plants belonging to the natural order Umbelliferae and the tribe Peucedanee. The cayx consists of 5 minute teeth, the petals abortive with an infixed point, the outer ones radiant. There are 34 species native to this part of Europe, found in Great Britain, and few are applied to any useful purpose.

H. Sphondylowum, Cow Parsnip, has tunicate pinnate leaves, the leaflets banded or pinnatifid, cut, and serrated. The stem is about four feet high, the leaflets very large, and the flowers white or reddish. It is a native of Europe, and probably of Siberia, and is found plentifully in the meadows and heath of Great Britain. The whole plant affords wholesome and nourishing food. It is often called the cow parsnip. The thistles, in Sussex and the neighbouring hogs; hence it is sometimes called hog-cow. Cows and rabbits are also fond of it, and horses will sometimes eat it, but it does not appear to be so agreeable to them. The Kemptihalitae and Russians are in the habit of using the shoots and leaf-stalks as food, after the rind, which is bitter, has been taken off. They collect large bundles of the plants, and during the process of drying the stalks become covered with a savoury efflorescence which is esteemed a great delicacy. The Russians distill an ardent spirit from the stalks thus prepared by first fermenting them in water with barley. The seeds of the plant are diuretic and stomachic, and excite a powerful salivation.

H. Rubescens has tunicate leaves, somewhat pubescent beneath; the leaflets toothed and pinnatifid; the umbels of many flowers, to 2 leaves; the fruit ellipitic, having the disk rather villous. It is a native of Turkestan in that part of the Caucasus and the Caucasus in Alpine places. The young shoots are filled with a sweet aromatic juice which is eaten by the natives of this country. It is native to the Eastern and Central Pyrenees, and of Italy. D. Don thinks that this plant is identical with the H. gummiferum of Willdenow, which was supposed to yield the gum ammonicum of commerce, but is now however identified with a plant which yields this gum, and has placed it in a new genus. [Dorset, P. C. S.]

All the species of Heracleum grow well in any soil, and are easily increased by seed or by dividing the roots.

(Don, Gardner's Dictionary; Burnett, Outlines of Botany; Babington, Manual of British Botany.)

HERACLITUS, Roman emperor from A.D. 810 to 641. Son of the nobleman C. Heracleides. In the Roman era he is called xonia, containing the life of this great emperor, the importance of his ministries, and the adjacent countries as regards Europe has been much increased, and accordingly it appears useful to give a few additional descriptions of the country, the religion, the Persians, which are of equal interest for the historian, the geographer, and the soldier.

The deistate condition of the empire at the accession of

Heracletus compelled him to be an almost inactive spectator of the ruinous invasions of the Avars in Europe and the Persians in Asia. By submitting to an annual tribute of one thousand talents (pounds?) of gold, as many talents of silver, one thousand horse, and all the silk robes, and one hundred and eighty slave-maidens, he was able to quiet the Persian king Choresme or Khorwar to discontinue his invasions of Asia Minor and to be satisfied with the conquests he had made from the Greek empire, which comprehended Egypt and the whole of the Asiatic provinces east and south of a line drawn from the northern frontiers of Syria to the eastern extremity of the province of Pontus. Heracletus made a less humiliating peace with the Avars. Having got rid of his enemies, he began to attend to his own affairs, which were somewhat disarranged by the pillage of the property of the churches; and he was thus enabled to raise an army strong enough to stop all further designs of the Persian king. The plan of attacking that powerful foe was bold and well designed, and it was executed with so much boldness and prudence, and such a startling combination of offence and defence, as to equal the strategical operations of the greatest geniuses.

A powerful Persian army was stationed in the valley of the Upper Euphrates ready to descend through the passes of the Anti-Taurus into the high plains of Cappadocia, and to push on towards Constantinople as they had done in A.D. 616. The army of Heracletus, consisting chiefly of raw levies, was quartered in the environs of Constantinople, and afterwards in those of Chalcodon on the Asiatic shore of the Bosporus, and, after a whole winter, was transported to the opposite bank of the strait. But Heracletus was master of the sea, and his numerous fleet enabled him to choose his base of operation. Early in the spring of 622 he embarked his troops, and from the Bosporus was able to land them at the mouth of the river, on the bay of Iskinderin (Alexandria), and is protected on the north and east by the Taurus and on the south by Mount Amamus. There on the plains of Issus he continued accustoming his troops to actual warfare by making them manoeuvre in the same way as modern troops do, and he occupied the Cilician and Syrian gates and other passes that lead through the surrounding ranges. A Persian army approaching in full force, but finding no enemy to meet them, they were glad to re-embark, was turned, routed, and driven into the mountains of Armenia. Having thus cleared his way and secured his rear, Heracletus marched through the Cilician gates northward in the direction of Mount Argeus (Arijal) and the Upper Halya (Kizil Irmaq), where, as seems a portion of his troops remained during the winter as a body of observation. The emperor with the main body advanced upon Trebizond, and quartered his troops in the province of Pontus. Trebizond now became the centre of his operations. He left it, however, soon after his arrival, sailed to Constantinople, and in the following spring of 623 returned with a fleet and a chosen body of his troops. It is impossible to give a correct idea of the army, for conveying his army by sea to the south-eastern extremity of Asia Minor, and thence fighting his way through inaccessible passes to the right across Asia Minor and through the Euxine, if he intended to march towards the base of his operations into Trebizond, for it seems that he could have gone there directly from Constantinople without incurring the risk of losing half his army, and perhaps all of it, in the defiles of the Anti-Taurus. Our sources say nothing of his motives, and generally we know few details of his first campaign. However, if we take the state of the empire into due consideration, and draw conclusions from his subsequent campaigns as to his first, we cannot hesitate to believe that Heracletus intended to attack Persia from two points, each of them equally well situated for an attack and affording equal security in case of a forced voluntary retreat. And it is probable that he chose the bay of Iskinderin for his place of disembarkation, and thence marched towards the Euxine, because he wanted to relieve, through his presence at the head of an army, the minds of those of his subjects who were most exposed to the inroads of the Persians, and to occupy as many mountain-passes as possible in order to prevent the Persians from breaking through the defiles between Cappadocia and the Black Sea. As he advanced to the Upper Halya, he divided his army.
especially the Mediterranean, and lands sufficient forces as either of those points, will effect or prevent the conquest of all Asia Minor and the adjoining eastern countries with less force and in a shorter time than any power which is only a land power. The outer powers of the Mediterranean and the western provinces from the defence of his hereditary dominions, and thus to relieve his subjects and increase his means.

From Trebizond Heraclius carried the war, in the spring of 624 into the heart of Persia. The nations in the Caucasus were his allies, and he had entered into negotiations with the khazars beyond the Caucasus. These were the causes of his first advancing north-east into the Caucasian provinces, and only after having shown himself there and increased his army through the contingents of his allies, he marched south upon Charsa (Kars) and thence in a direction parallel with the Araxes as far as the great bend of that river, where, after a south-eastern and eastern course, it turns north-east. Thence he marched right upon Ganza or Gaudza, which is the still common Armenian name of Tabriss, and this city fell into his hands with all its wealth, Choreses, who had been defeated by the Persians and driven out of the region, and that he might offer battle for the relief of his northern capital. According to an absurd tradition Cressus, King of Lydia, had saved his treasure and his diadems which he was kept till then, because they became a trophy of Heraclius. From Ganzas Heraclius advanced south, turned the Persian army and fell upon their rear, took and destroyed Thabarmas, now Ordinianyeh, near the western shore of the Araxes, where he was born, the birth-place of Zoost.Should, and many other cities which have not yet been identified, and at last wheeled round and took up his winter-quarters in the flat country between the Lower Araxes and the Caspian, which is now known as the plains of Mogun. We may suppose that he chose that tract, which is renowned for its vast pasturages, for the support of his numerous cavalry, and for the purpose of having an easy communication with the Khazarus and the eastern provinces of Mesopotamia, and the Iron Gate, near Derbent, whenever they invaded Persia.

In the following year, 624, Heraclius penetrated into the heart of Media, took Casbin, and probably also Aspahan (Ishafan), defeated Choreses in a pitched battle, and, after having carried the Roman army farther into Persia than any of his predecessors, returned to his former winter quarters at the foot of the Caucasus.

Our knowledge of the campaign of 624 is very imperfect; the accounts in the sources are vague and scatty, and the whole is so obscure that D'Anville gave up the idea of investigating it critically.

During this time Choreses had withdrawn his troops from Egypt and Syria, and thought himself strong enough to act on the offensive. In the spring of 625 he ordered his lieutenant Sarbar, or Sarbarus, to menace Asia Minor, while Heraclius took up his headquarters in the Caucasus. Sarbar was in Northern Mesopotamia; however, he did not take his way through the inland tract, which he had to besiege and capture the place of Khassar, Maladit, and Amasia, through the province of the Khassars and the north-eastern part of Caucasus, and in the direction of the Caspian and Kaisariyeh through the centre of Cappadocia; but he marched south-west and fell upon the eastern angle of Cilicia. His intention was apparently to take the easiest way for penetrating into Asia Minor, to cut off the communication between the Romans in the fortresses of the Khassars and the to the ruined bastions of the Caucasus, and to destroy the magazines of the Romans in Cilicia. Informed of this diversion, Heraclius moved on; but while he appeared to threaten the main body of the Persians under Choreses, he suddenly passed by, left the danger of Armenia to his Caucasian allies, and followed Sarbar through Mesopotamia, either by his track or on a parallel road. They met in Cilicia on the banks of the Sarus, now Suhin, at a moment when Sarbar was in a very critical position, and about to be attacked by the Khassars, who had been driven out of the Caucasus by Heraclius. The Persians were now taken by surprise, and the whole of the Khassars and the Khazar Choreses sent a dispatch to Sarbar, with an order to give up all further designs against Constantinople, and to join him without delay in Persia. The messenger having fallen into the hands of the Romans, Heraclius altered the dispatch, enjoining him to hold out as long as possible, and the letter was forwarded through another courier. Sarbar continued the siege, but Heraclius now despatched a second messenger to the first lieutenant of Sarbar with an order to kill his general as a traitor. This dispatch having been delivered to Sarbar instead of to Choreses, the latter was put to death by a hundred of the principal officers as being all destined to be sacrificed to the anger of their master, whereupon he showed them the order, and declared the only way to save themselves was to break their allegiance to Choreses, and so to make peace with the emperor on their own account. The officers gave
HERBERT, JOHANN FRIEDRICH, a distinguished German philosopher, was born in 1776, at Oldenburg, where his father at the time held an office connected with the administration of the Hanseatic League, and he became acquainted with the philosophical systems of Leibnitz and Kant. Herbert, at the age of about twelve, was led to speculate upon such subjects as God, freedom, and immortality. He then proceeded to study law at the University of Jena, where he studied under Fichte, and formed an intimate acquaintance with him, and he entertained the highest opinion of his master until Schelling's work, 'Von Ich,' fell into his hands. He then abandoned his old views, and formed a new system of philosophy. He had previously been interested in the idea of employing mathematics, and the more clearly Fichte explained his views upon psychology in his 'Sittenebren' (Leipzig and Jena, 1798), the more Herbert became convinced that the speculations of Fichte must be abandoned if any permanent basis was to be gained for his science. About the same time he devoted himself with great zeal to the study of the antient system of philosophy, which led him to form an intimate acquaintance with the systems of Plato and the Eleatics. However he continued his own researches which he had commenced under Fichte, and from 1802 to 1805 he delivered a course of lectures in the University of Göttingen, where he developed his peculiar method of thought, and from which his system subsequently much extended, but remained essentially the same as it had been from the beginning. His tendency was to free metaphysics from all materialistic and mechanical circumstances, and partly to his personal acquaintance with Pestalozzi, that his first works treated on education; in 1809 he was appointed professor of philosophy at Königsberg, and was at the same time entrusted with the superintendence of the higher educational establishments in the eastern parts of Prussia, in the organization of which he did great service. In 1833 he was invited to the chair of philosophy in the University of Göttingen, where he returned (1833) the greatest attention on account of the clearness and precision with which he explained his views. He remained at Göttingen until his death, on the 4th of August, 1841.

Herbert is the founder of a particular system of philosophy, which is interesting on account of his peculiar method rather than his originality of thought, for in reality his system is of a syncretic kind, and Fichte's influence upon it cannot be mistaken. Although Herbert occasionally professed to be a follower of Kant, still he is of opinion that Kant's 'Criticism of Pure Reason' is almost without any objective value, and that its method must be entirely abandoned if metaphysics are to be preserved. The 'realistic tendency further reminds us of the monads of Leibnitz. Philosophy, according to Herbert, has, not, like ordinary sciences, any particular set of subjects which are its province, that it is not affected by any particular subject whatsoever is treated. The subjects themselves are supposed to be known, and are called by him 'notions' (Begriffe), so that philosophy is the methodical treatment and way of thinking, a discourse on accurate definitions. The different methods of treatment constitute the main departments of philosophy. The first of them is logic, which considers the nature and clearness of notions and their combinations. But the contemplation of the world and of ourselves brings before us notions which cause a discord in our thoughts. This circumstance renders it necessary for us to modify or change those notions according to the particular nature of each. By the process of communication or change of intentions, which Herbert calls the supplement or complement (Erganzung). Now the second main department of philosophy is metaphysics, which Herbert defines to be the science of the supplement of what is wanted. The third department consists of the supplementary notions which are necessary in order to render given facts which contain contradictory notions, intelligible, is, according to him, the method of relations, and it is by this method that we eliminate contradictions. The fourth department of Herbert's system is the natural science, which he calls natural philosophy, or Belles Lettres. The map of Asia Minor and part of Persia, in Kimeir's 'Journey through Asia Minor, Armenia and Persia,' was taken from Herbert in his campaigns, but they are not correct. We want a complete critical commentary on the expeditions of Herbert, which would offer less difficulties now than it did to D'Anville, since our knowledge of the country is more exact than it was a hundred years ago.)
HERITAGES.

Heretics. The words "heresy" and "heretics" were used in various contexts throughout history. In the ancient world, heresy referred to beliefs that were not in accordance with the established religious doctrine. This could include variou
which they receive their encomiasts. So far as this, there is certainly no objection. There ought to be some speedy mode of depriving a man of these encomiasts, which he accepts upon certain terms. He who will receive them (Frankland, P.C.B.), and yet peace against the philosophical faculties of Munich, he is said to be paid for teaching, deserves the repudiation of all mankind; and those who dislike ecclesiastical authority most could not be better pleased than to see such an offender banished from the church, and put in any way that the rule of the church provides, to which the offender has solemnly submitted himself.

In the year 1630 proceedings were commenced in the Arcisian Congregacy of the Rev. Mr. Oakley for writing, publishing, and maintaining doctrines contrary to the Articles of Religion.

The history of Hermits in England is instructive. The change from burning alive to the free expression of opinion on religious matters is one of the steps in the social progress of England. For some other matters connected with the subject, see Beza.

HERMES, GEORG, the founder of a philosophical school of Roman Catholic theology, was born on the 22nd of April, 1775, at Dreyerwalde, near Münster in Westphalia, where he received his first education from the priest of the place. He subsequently became a pupil of the gymnasium at Rheinau, and there gave the first proofs, especially in his mathematical lessons, of his strong mental powers. After the year 1795 he entered the theological faculty at Münster, he devoted himself with great zeal to the study of the philosophy of Kant, and thus arrived at the conviction that no one can establish a perfect system of theology unless he has first seriously considered the first principles on which human knowledge is based. In 1796 he was appointed teacher at the gymnasium of Münster, and all his exertions henceforth were directed towards restoring, on a firm basis, that which had been demolished by Kant's 'Criticism of Pure Reason.' As a teacher at the gymnasium, he had no opportunity of making known the results of his philosophical studies. This opportunity however was offered to him in 1801, when he was appointed professor of the gymnasium. His great talent as a lecturer, and his kind and benevolent manners, attracted great numbers of students. On one occasion, when he had to give his opinion on some ecclesiastical question, he greatly offended Droste-Vicherthor, afterwards Archbishop of Cologne, and the ill feeling thus created had probably some influence in the subsequent proceedings against the doctrines and followers of Hermes. In 1819 Hermes was appointed professor of theology in the newly established University of Bonn. His lectures again attracted students not only from all parts of Catholic Germany, but the King of the Netherlands sent a large number of young men to Bonn for the purpose of studying under him. He obtained the esteem of the highest esteem both of his colleagues and pupils, and he died at Bonn on the 26th of May, 1831.

The only work that Hermes published bears the title 'Christology of the Roman Catholic Theology,' Münster, 1819, 8vo.; a second edition appeared in 1831. So long as the Archbishop Spiegel zum Dosenberg was alive, Hermes and his views were not attacked by the see of Rome; but soon after the elevation of Droste-Vicherthor to the archbishopric of Cologne, reports were made to Rome about the infidel tendency of Hermes's work, which still continued to be the chief theological manual at Bonn and other German universities, where the chairs were filled by the disciples of Hermes. There is no doubt that the denunciations against Hermes was in the first instance made by some German who was in communion with him, but it was taken up by Perrone, who made his report to the pope. The objectionable point in Hermes's work was his principle, that reason or philosophy must in the first place prove the reality of a divine Being, and second, the truth of the Roman Catholic system. These points being ascertained, Hermes demanded absolute submission to revelation. He does not attempt philosophically to prove the truth of every particular doctrine in the Bible, but the Church, he says, shall not be bound to publish his dogmas, and to demand submission to them. Hermes thus did not attack a single dogma of the Church, and his orthodoxy can scarcely be disputed; but if we consider that this principle was established, the right of exercising his private judgment, and at the same time remember that the Roman hierarchy had reason to dread every philosophical inquiry into its system, since, although Hermes remained orthodox, it was by no means certain that future theologians might not be led astray by their application of philosophy to theology, it will not be surprising to find that, on the 26th of September, 1835, the pope issued a brief against the work of Hermes. The severity with which this brief was enforced is an illustration of the rigor with which heretical practices produced a rupture between the courts of Berlin and Rome. The discipline of Hermes made all possible efforts to defend their master, and two of them, Professors Braun and Evinchen, went to the pope point out to his holiness that Perrone had misrepresented the views of Hermes. But their exertions were of no avail. The pope, as late as the year 1844, severely censured the Prince-bishop of Breslau for not being zealous enough in preventing the alienation of the disciples of Hermes. In the same year the professors Braun and Achterfeld of Bonn, who refused to recant their Hermeneutics, were forbidden to lecture in the university by order of the archiepiscopal coadjutor, Von Grimmel, at Cologne. The number of pamphlets that have been written for and against Hermes is prodigious, and has probably contributed not a little towards the religious movement now going on among the Roman Catholics of Germany. The best exposition of the whole controversy may be found in Evinchen's "Der Hermesianismus und sein Romischer Gegner Perrone, Breslau, 1844, 8vo."

HERMIT, more properly Eremite, from the Greek eremitein, signifying an inhabitant of a desert, is the name given to one of a particular sect of Christians who, becoming members of any monastic community. The distinction between hermits and monks, and the origin of both, are explained in P.C. under the term Morachismus (xv. 312). See also Dr. Leake, A.D. 16. 1745.

HERMOCYNES, a heretic of the early church, against whom Tertullian has written a treatise, was most probably a native of Africa, and flourished, according to Damase and Le Clair, 2016. 'The information we possess respecting him is contained in Tertullian and Theodoret. It appears from the former of these writers that Hermogenes, though professedly a Christian, had throughout his life evinced a strong admiration of the heathen philosophy, and especially to those of the Stoics. He is accused of having taught that God made the world out of matter that was exterior to himself. The chief design of Tertullian's treatise is to confute that notion; his principal argument against him is, that if matter be eternal, there must necessarily be two Gods, which however Hermogenes did not allow, but expressly asserted the existence of one supreme governor of the universe. The following, in a few words, appears to have been the system of this heretic: he did not introduce any con or any creator different from the one God, the Father; but he asserted the eternity of matter, and that it was created by God as the means whereby he had a confused and turbulent motion, and to it he ascribed all the evils which exist in the creation. It was out of this confused matter that God brought order and perfection. He had, it is believed, in a first act of creation, probably, most of the other great doctrines of religion, as he is not charged by either Tertullian or Theodoret with any other heresy than that to which we have just alluded: he made no account of any of his writings, though it may be inferred from the arguments of his opponents that he was an author. We are ignorant of the year of his death. For a fuller detail of his opinions see Lardner, Hist. of Heretics, ch. xvii.; Tille- mont, Hist. Eccl.; and Cave.

HERNANDIAEÆ, an unnatural order of incomplete Eustomous plants. It has nonocious or hermaphrodite flowers, some parts of which, however, are inserted in the axillary spurs or corymbs. The species are trees, shrubs, and climbers, with alternate leaves, and flowers arranged in axillary sprays or spikes. This order has been constituted by Blume. It contains only two genera, Hernandia and Inocarpus. These are sometimes regarded as a family, but the absence of albumen from their seeds. Their longitudinal anthers distinguish them from the Lauraceae, in which order they have also been placed. Their affinity is undoubtedly with Thymelaeaceae, from which they differ only in their dru-
passecous fruit, lobed cuticle, and the involved to some of the other species of the

Hernandia, the typical genus of this order, was named after Hernandez, a naturalist sent out to Mexico by Philip II. of Spain; and it is said to have been given to these plants, which have large leaves and little flowers, in allusion to the great opportunities afforded to this naturalist and the little use he made of them. The characters of this genus are the same as the order.

Hesperia is a tall erect tree, with coriace leaflets, yellowish yellow flowers, a large insectivorous calyx, with a small roundish entire mouth. It is a native of the various parts of the East and West Indies, and has obtained its place in this order by its beautiful inflorescence through its persistent involucres. The bark, the seed, and the young leaves of this tree are slightly cathartic. Rumphius says that the fibrous roots chewed and applied to wounds produced by the Macassar poison, act as an effectual cure. The juice of the leaves is employed as a depilatory. It destroys the hair wherever it is applied, and this without producing pain. The wood of this species is very heavy, and Asnelt says that the wood of H. Guianensis takes fire readily from a flint and steel, and may be used as tinder. Several species of Hernandia are mildly purgative.

(Lindley, Natural System; Lindley, Flora Medica; Burnett, Outlines of Botany.)

Hesperis (from 'Hesperus,' the evening), a genus of plants belonging to the natural order Cruciferae, and the tribe Brassicaceae. The flowers are opening the night, and hence the genus derives its name. The pods are quadrangular, or sub-compressed, the valves keeled and somewhat swelled, the seeds in a single row. There are only three species of Hesperis, and are either a peculiar use of man but as ornamental and sweet-scented plants.

H. Matronalis, Dame's Violet, is the only British species; it has an erect branched stem, ovate lanceolate leaves, and large handsome flowers. The ladies of Germany have pots of this plant placed in their apartments; hence it has been called Dame's Violet. Parkinson calls it Queen's Gilliflower; and Gerard, Damask Violet.

A violet is a plant in a light soil, and requires the same treatment as most other hardy plants.

(Don, Gardener's Dictionary; Babington, Manual.)

Hexapla, the plural of Hexa, which means 'six fold,' was an edition of the Scriptures of the Old Testament prepared by Origen, which exhibited, in addition to the original Hebrew text, a Greek text, its variants in parallel columns; namely, the Septuagint, that of Aquila, that of Symmachus, that of Theodotion, one found at Jericho, and one found at Nicalopis in Ephesus. It also comprehended a seventh version of the Psalms. The Hebrew text was besides given both in Hebrew and in Greek characters: so that properly speaking there were eight columns in all, whence the work is sometimes called Origen's Octapla. And he also prepared a less extensive work, containing only the versions of the Seventy, of Aquila, of Symmachus, and of Theodotion, which he entitled Tetrapla. Only some fragments of Origen's Hexapla remain, which have been collected and published by Birch, but it is said that the Hexapla known as The Hexapla quae superstant, 2 vols. fol., Paris, 1718. There is also a later edition, which however is held in less estimation, by C. F. Riedel, 2 vols. fol., Leipsic, 1769-70. Before Montfaucon published his edition, which is now of great rarity, many fragments of the Hexapla had been collected by Petrus Marinus Parisius, and inserted by Flaminio Nolius in his Greek Bible printed at Rome in 1587: and all that had then been recovered were given, by Joannes Drausius in his 'Veterum Interpretatione Graecorum Fragmenta,' Arnheim, 1622.

(See P. C. Aquila, ii. 206; Bible, iv. 372; Septuagint, xii. 257; Symmachus, xiii. 445; Theodotion, xii. 326.)

HEYWOOD, JOHN, one of our earliest dramatic writers, lived in the first half of the sixteenth century. He was probably a native of London, and it is said, was a seaman at North Mins, in Berks, where he is supposed to have made the acquaintance of his neighbour Sir Thomas More. This lover of wit introduced him at the court of Henry VIII., and it is said, that his talents were so remarkable by way of satirizing all the singulars, and his livelihood, both in society and in his writings, gained him high favour. To Queen Mary he was further recommended by his zealous attachment to the Church of England. In the reign of Edward VI., he was one of the soldiers plotting against the government, and is said to have with difficulty escaped the halter. He retired to the continent, and died about 1565, at Mechlin, in Brabant. Heywood's drama and satirical pieces stand in a distinct section. They are divided into two distinct sections. They may properly and strictly, says Mr. Collier, in his 'History of Dramatic Poetry,' be called Interludes—a spe.
cules of writing of which he has a claim to be considered the inventor. The earliest of them, 'A Merry Play between the Pardoner and the Friar, the Curate and Neyerbhr Prate,' was written in 1383, but must have been written before 1291. In Dodgson's Old Plays will be found his 'Play called the Poure F. P., a new and a very merry Enterlude of a Palmer, a Pardoner, a Pottery, a Pedlar,' which is a fair specimen of the fantastic arrangement of the grotesque and coarseness of his humour. Among the other productions bearing his name was a posthumous volume of 'Woorkes,' 1578, 4to., which contains proverbs in verse, and six hundred woodcut illustrations in which his own time he was probably better known. In respect of them, and to distinguish him from a later play-writer [Hewwood, Thomas, P. C.], he is not infrequently called 'The Epigrammatist.'

The CRACH'T, a genus of plants belonging to the natural order Composite. The heads are many-flowered, the involucre imbriicated with many oblong scales. Fruit terete, crogular, and furred, with a very short crenulated margin. There are nineteen British species of this genus, but none of them are valuable on account of the properties they possess.

H. pilosella has a leafless single-stemmed head; elliptic-lanceolate or lanceolate leaves, hairy above, glabrous beneath. The flowers are of a pale lemon colour with a red stripe on the back. It is found on dry banks and elevated places.

H. alpium has lanceolate leaves narrowed into a footstalk, entire or toothed; the involucre is covered with long silky hairs externally and with a white, smooth, bright yellow colour. It is found on rocks in Great Britain.

(Huntington, Manual of British Botany.)

IIEROCLOE, a genus of grasses belonging to the Phlaeantidae family. There are seven species, nearly equal, superficially similar, and of a bright green colour, about as long as the flowers; three flowers, the lower with three stamens, the upper palea with two keels, the upper flowers with both stamens and pistils, the stamens two, the upper palea with a keel. One species of the genus has been found in Great Britain: it has an erect panicle, glabrous pedicels, and flowers without awns. The stem is about a foot high. It has only been found in Scotland.

(Huntington, Manual of British Botany.)

HIGH COMMISSION COURT, a tribunal established by Queen Elizabeth under the authority of a clause in the Supremacy Act (1 Eliz. c. 1), which exercised arbitrary power in matters of faith and in ecclesiastical concerns as the Star Chamber did in civil affairs. The commissioners were forty-four in number, of whom twelve were ecclesiastics, and three commissioners constituted a quorum. Their jurisdiction extended over the whole of the kingdom, and included all classes. They were directed to visit, reform, redress, order, correct, and amend all errors, heresies, schisms, abuses, offences, contumacies, and enormities whatsoever in the church under any ecclesiastical authority whatever which might be lawfully ordered or corrected. The commissioners, or any three of them, judged at their own discretion of any speech or writing which tended to heresy or schism. All appeals from their decisions were made before the Court of High Commission. The court was empowered to punish incests, adulteries, fornications, and any crime or corrupt practice in matters of matrimony. Other ecclesiastical courts had been subject since the Reformation to prohibitions from the supreme courts of law, but this court was exempt. It exercised its powers therefore without control, and was authorised to conduct its proceedings, not only by the ordinary laws of justice, by witnesses, and to use 'all other means and ways which they could devise.' This empowered them to resort to the rack, to torture, inquisition, and inquisito to proceed, not only to the excommunication, but at their own discretion upon rumour and suspicion. The court could bring before it a suspected person, and by administering to him an oath, compel him to answer any question, and especially to swear that he himself or his father by this oath was punishable by imprisonment. Fines were levied which often ruined the offender, and he might be imprisoned for any length of time at the discretion of the court. The greatest rigour of the court was especially to punish any departure from the Act of Uniformity in matters of religion or in the services and ceremonies of the Established Church. Elizabeth, in a letter to the Archbishop of Canterbury, said that he was required by the Three Estates to refrain from any measure which would be contrived to undermine any man should they be suffered to decline, either on the left hand or on the right hand, from the drawn line limited by authority and by her laws and injunctions. The Commons remonstrated strongly against the tyranny of the Court of High Commission, and by way of answer she granted towards the close of her reign a new patent in which the powers of the court were in some respects extended.

In the reign of James I., the sentences of the Court of High Commission were most generally confined to deprivation; but when the Commons remonstrated on account of its proceedings he refused to interfere. In 1610, by virtue of the royal prerogative it exercised full and unlimited authority over the Church of England, and with the full powers of the former courts. Sancroft, archbishop of Canterbury, refused to be a member. Four of the commissioners were bishops, and the three laymen were the Earl of Rochester, Chancellor Jeffries, and Lord Chief Justice Herbert. The Revolution swept away this arbitrary institution.

HIGH CONSTABLE. [Constable, P. C., p. 466.]

HIGH STEWARD. [Steward, Lord High, P. C.]

HIGH TREASON. [Treasos, P. C. ; Law, Criminal, P. C. S.]

HIGHMORE, JOSEPH, a portrait- and historical painter of some eminence in his day, was born in London in 1592. He was the nephew of Higmore, Serjeant-painter to William III., and was originally bred to the law, but having a decided disposition for painting, he gave up the law and became a pupil of Simon Vouet. He was the first English painter at Lincoln's Inn Fields, where he painted a set of portraits of the Knights of the order of the Bath, which has been engraved by John Faber the Elder. He was a man of general information; he had a good knowledge of anatomy and was thoroughly acquainted with perspective. He used to attend Cheeselden's lectures, and he made the drawings for his treatise on perspective; we owe to his pen practical books on perspective: - 'The Practice of Perspective, on the principles of Dr. Brook Taylor'; in a series of Examples, from the most simple and easy to the most complicated and difficult cases, London, 1783. He published also a critical examination of the ceiling painted by Rubens, in the Banqueting-House at Whitehall; it represents the apotheosis of James I. Highmore painted many portraits of royalty, nobility, and gentry, one of the best of which is that of Young, the poet, at all Sou's College, Oxford. His historical pieces are of only average merit: one of the best, Hagar and Ishmael, was presented by him to the Foundling Hospital; there it is in the same institution a portrait of Mr. Emerson by him. He painted several pictures from the works of Richardson the novelist, but his chief work was taken from the first part of Dryden's 'King Arthur' in 1679, in the house of his daughter, who was married to one of the prebendaries of that city, and he was buried in the cathedral.

(Gentleman's Magazine, April, 1780.)

HIGHTEA, a genus of ferns native to the Atlas of Sheppey. [Bowerbank.]

HILLARD, NICHOLAS, limner, jeweller, and goldsmith to Queen Elizabeth and to James I., was born at Exeter in 1547; his father, Richard Hilliard, was high sheriff of Exeter and Devonshire in 1560. Hilliard, a jeweller by education, acquired painting by studying the works of Holbein and Honthorst, and became celebrity as a miniature painter. Dr. Donne, in a poem on a storm in which the 'Earl of Essex was surprised, returning from the island voyage, says—

By Hilliard drawn, to worth a history
By a worse painter made.

There are many miniatures, especially of ladies, by Hilliard extant. He painted Mary, Queen of Scots, Elizabeth several times, James I., and Prince Henry. He had for twelve years the exclusive privilege of painting and engraving the portraits of James I. and the royal family. Charles I. possessed several by Hilliard, but it was thought to be a man should they be suffered to decline, either on the left hand or on the right hand, from the drawn line limited by authority and by her laws and injunctions. The Commons remonstrated strongly against the tyranny of the Court of High Commission, and by
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HINCMAR was born in France in 866. He was of a noble family, and nearly related to Bernard, Count of Lou- uson. At a very early age he was placed under the care of Hilduin, abbot of Soissons, who had acquired a high reputation for learning and strict observation of monastic discipline. His talents and high birth brought him under the notice of the Emperor Lewis the Meek, at whose court he frequently attended. In 848, having fallen under the displeasure of his royal master, he was banished from the court, and retired to Saxony, whither he was accompanied by Hincmar. On the death of Hilduin, his successor Lewis, an illegitimate grandson of Charles the Bald, again introduced him to the court of the emperor, who presented him with the government of the abbeys of Notre Dame at Compiegne and St. Omeron. On this occasion he excelled his respect for the observance of the canon law, which at that period was often set aside, in requesting the sanction of the bishop of the diocese, and that of his own abbot, previous to accepting that prebend. In the year 943 was assembled the first council of Beauvais, consisting of ten bishops of the provinces of Rheims and Sens. In that council the deposition of Ebbonius, archbishop of Rheims, was confirmed, and Hincmar was elected by the clergy and people to succeed him. In the year 956, at the session of the Synod of Sois- sons, eight articles of convention between the emperor and Hincmar were drawn up, defining the extent of their separate jurisdictions in matters ecclesiastical; and the following year a synod at Sens, of which the powers of the metropolitan bishops were more clearly defined and extended.

About this period Godesclauclus, a native of Germany, and monk of Orbais in France, attracted popular notice by a new exposition of the doctrines of St. Augustine on predestination. His peculiar views on this abstruse subject were promptly brought forward during a pilgrimage which he made to Rome, and drew upon him the displeasure of the principal theologians of the day. A council was convened at Mayence by Raban Maurus, archbishop of that city, in which the opinions of Godesclauclus were combated and condemned, the arguments against him being chiefly deduced from the writings of St. Au- gustine himself. It was then resolved to transmit his text, and to leave the judgment to be pronounced upon him by Hincmar, in whose province was situated the monastery of Orbais. The peculiar opinions of this impudent monk, magnified by the hostile interpretation of them which Raban Maurus gave, caused him to be attacked from all sides. Men, beginning from the emperor, were in turn directed against him. From one who had already begun to rule the church in an iron hand. Hincmar caused him to be accused before thirteen bishops at the council of Quierzy, where he was declared an incorrigible heretic and deposed from the episcopal dignity, and into which it appears, he had been irregularly admitted.

This punishment, however, was not sufficient to appease the rancor of his judges; the bold enunciation of his tenets was construed into sedition, and, as such, punishable, according to the rule of St. Benedict, by corporal chastisement. He was condemned to a public flagellation, and to commit his writings to the flames, which sentence was executed with all the cruelty so characteristic of that barbarous period. He was afterwards confined in the monastery of Hautvilliers, where, twenty years afterwards, he ended his miserable existence.

In the year 820 Hincmar embellished and enlarged the church of St. Remi, and reformed the chapter, and caused a magnificent vault to be constructed, in which he deposited the relics of its patron saint. The following year he assisted at the council of Soissons, in which all the ministerial acts of his predecessor Ebbonius were declared void; the donation of Sens was confirmed, and the claim of that diocese alone excepted. In 827 he composed his first great work on Predestination, the preface of which is the only part extant; in it he examines the subject of Hincmar. In the mean time he continued the work of the new cathedral; he was accused of having fallen into the opposite error of semi-Pelagianism. About this time also he wrote several letters to Charles the Bald, in which he complains of the misfortunes of the churches and monasteries, and endeavors to intimate that the depredators were emboldened, if not by the countenance of the king, at least by the knowledge that the offenders would go unpunished. These letters present a singularly interesting picture of the state of matters at that age. A few years later he wrote a second treatise on the

(Anon. Union, 1840; Catalogues of the Exhibitions of the Real Academy.)

In 1814 he exhibited Miranda and Ferdinand bearing a Log; and he was elected an Associate of the Academy in the same year. He was elected a member in 1820, when he exhibited his picture of Ganyande, which he presented to the Academy as his diploma piece. In 1825 he exhibited his Christ crowned with Thorns. Two years afterwards he succeeded Fuseli as keeper of the Academy, a post which he held until his death on the 30th of December, 1835, in his fifty-sixth year.

Hilton died in possession of his best pictures—The Angel releasing St. Peter from Prison; Serena rescued by Sir G. C. Northcote; the Meeting of the Sun and the Moon, exhibited in 1838, the last work exhibited by Hilton in Amphi- trite; Una with the Lion entering Coreca's cave; and Rizaph watching the dead bodies of Saul's Sons (unfinished). Sir Calpine rescuing Serena, exhibited in 1831, was pur- chased by subscription from Hilton's executors, for 500 guineas, and was presented to the National Gallery, where it now hangs, and it is one of the most attractive English pictures in the collection, though far from being the best of Hilton's works. Una entering the cave of Coreca, exhibited in 1832, was purchased by R. Ellson, Esq., and was engraved by W. H. Watt for the Art Union of London, and distributed among the subscribers of 1840. The St. Peter delivered out of Prison by the Angel, of which the figures are of the size of life, also exhibited in 1831, was purchased by William Bishop of Plymouth. Mr. Robert Vernon, who possesses the best collection of recent English paintings extant, has two capital works by Hilton—Rebecca with Abrahams servant at the Well, exhibited in 1829; and Edith and the Monk searching for the body of Harold, exhibited in 1834. The following also are of the same school—The Monk in the garden, exhibited in 1828, and in the collection of the Very Rev. Dr. Hume, in Lichfield; the collection of Mr. John Swinburne, Bart.; Jacob parting from Benjamin, in the possession of W. Wells, Esq.; the Graces teaching Cupid to play on the Lyre, the property of Sir J. J. Bartholomew, Bart., in the collection of Mr. Charles Westmacott, Esq.; the Angel and the Lily, in the collection of the Very Rev. Dr. Swinburne; the Group from the Quirin, belonging to W. Smith, Esq.; Cupid and a Nymph, the property of J. R. Turner, Esq.; The Rape of Europa, painted for the late Earl of Egremont, of which there is a print by Charles Westmacott, which is exhibited.

The greater part of the above-mentioned works were exhibited with the works of old masters at the British Institution in 1840. Hilton must ever rank very high among the painters of his own country, up to his own days, but his glory will dimly hhh

as the sphere of comparison is extended. He was not a great painter; his energy was not extraordinary, nor was his invention exuberant, but his colouring is harmonious and rich, and his technique and design were refined and ample. The figure of Sir Calpine, in the National Gallery, is not a very good specimen of his style; it is exaggeraded, and is not upon its feet. This is a peculiarity which occurs more than once in Hilton's works; his figures want the specific gravity. Those who knew him describe him as a man of much intelligence and great amiability. His manners were pleasant and dignified and his voice was low; and his demeanour peculiarly quiet; like all men of genius he was modest, retiring, and unassuming. He died a widower, and childless.
subject of Predestination, which has been preserved. The arguments in it are chiefly directed against the opinions of the learned John Scotus Erigena, whom he accuses of error respecting the nature of the Trinity in the eucharist. Among other curious accusations brought against Scotus, he charges him with believing that the soul of man is not lodged in the body, and that the portion of matter consigned in resumption of conscience caused by the remoteness of sins.

In the year 862 we find Hincmar engaged in controversy with the pope, Nicholas I., one of the most learned ecclesiastics of the time. The occasion of the dispute was as follows: Rotharius, bishop of Soissons, had incurred the displeasure of his metropolitan, Hincmar, on account of the deposition of a priest of his church, whom Hincmar wished to restore to office. Rotharius, dreading the consequences of his act, was condemned in two councils held at Soissons, excommunicated, and afterwards deposed and imprisoned. On an appeal of Rotharius to Rome, the pope issued a peremptory order to Hincmar to restore this bishop to his see within thirty days, or to appear at Rome, either in person or by legate, to answer the charge which had been made against him. In the year following, Hincmar commissioned Odo, bishop of Beauvais, to proceed to Rome, and to request a confirmation of the decrees of the council of Soissons. Nicholas, irritated at the opposition of Hincmar, rescinded the decisions of that council, and declared that the liberation of Rotharius, in order that he might plead in his defense at Rome the validity of his appeal. This demand was first resisted by Hincmar, but, through the interference of the king, Rotharius was released, and deposed. The liberation of Rotharius, and the pope to state the reasons of his conduct. This triumph of Nicholas was soon succeeded by one more important; Rotharius was restored to the episcopal dignity, and he returned to his diocese accompanied by a legate of the pope. The pretensions of Rome in this affair were founded on 'The Decretals of the Ancient Pontiffs,' a work probably composed by Sisdat Mercurius, but claiming much greater antiquity. Hincmar, though the most learned canonist of the age, does not appear to have doubted the authenticity of these Decretals.

The interference of the Pope in temporal matters was however more successfully resisted. On the death of Lothaire, king of Lorraine, Adrian II. was desirous of excluding Charles the Bald from the succession of his states, and to bestow them upon the Emperor Lewis. To this effect he addressed two letters, one to the nobles of Lorraine, and the other to the subjects of Charles, threatening excommunication should they disobey his injunctions to favor the cause of Lewis. Hincmar, in the name of his fellow subjects, replied to the pretensions of the Pope. In his letter he remarks that Adrian, on a notion that he is the king and bishop, and that his predecessors had regulated the church, which was their concern, not the state, which is the heritage of kings. The opposition was successful, and Charles was enabled to retain possession of the throne of Lorraine, of which all the subsequent efforts of the disappointed pontiff were unable to deprive him.

In the year 871 Hincmar presided at the Council of Douai, composed of twenty bishops assembled by the order of Charles the Bald, for the purpose of inquiring into the conduct of Hincmar, bishop of Laon, nephew of the archbishop of Rheims. He was accused of spoliation of church revenues, of usurpation of powers not properly belonging to a bishop [INTERDICT, P.C.], and of revolt against his sovereign. His uncle appears to have conducted the trial with severe impartiality, on condition, sentenced him to be degraded from his ecclesiastical office.

About ten years after these events Hincmar exercised the same firmness in defending the rights of the church against the encroachments of the secular power. A claim, it is to be shown in opposing the claims of the Roman pontiff. Lewis II. wished to bestow the bishopric of Beauvais upon Odacer, a favorite courtier, who had been rejected as unworthy of the office by the Council of Vienne, and he exerted, both by supplication and menace, to obtain the acquiescence of Hincmar to his nomination. This prelate, however, boldly defended the liberty of canonical elections, and the independence of the church. The metropolitan, Lewis, was so nearly removed from him by the sanctity of the oath he had taken to respect the privilege which the church possesses to refuse induction to unworthy candidates, and warns him against arrogating to himself a power which had been denied to the most eminent of his predecessors. 'I trust,' he observes in it, 'ever to preserve inviolate my fidelity and devotedness to your service, indeed I have not a little contributed to your own election; I return the favor, it is true, and I do not grieve any body; but this case made me in my old age to depart from the holy rules of the church, which, thanks be rendered to God, have ever been my pride during six and thirty years of my episcopacy.' (Hincmar, p. 188.) He proceeded to assemble a council, in order that his nomination may be ratified by the clergy and people of Beauvais. In a second letter he uses still stronger language, and terminates it with these ominous words: 'In the name of the Father, and of the Son, and of the Holy Ghost, be this act of grace and love which I have performed, not on the earth, but the church with its pastors, under J.C.'s chief, has, according to his promise, an eternal existence.'—'This threat,' says Fleury, 'appeared a prophecy, when the king, years afterward, in a fit of passion, had his son, the king's, youth, died the following year.' (Fleury, b. iii. c. 31.)

Hincmar did not however long survive his royal master; about this period the Normans extended their predatory incursions as far as his province, the principal towns of which they pillaged and destroyed. They were advancing towards Rheims, when notice of their approach was given to Hincmar, who was obliging enough to leave the city by night, having previously taken the precaution to secure the treasures of the church, and the relics of St. Remi. The aged prelate arrived at Epenau, worn down by fatigue and anxiety. Severe illness compelled him to seek a place of rest, and on the 12th of December 882 he ended his eventful life. The name of Hincmar, though associated with the darkest period of ecclesiastical history, will ever be conspicuous as that of one of the most zealous defenders of church liberty and Rome. He was the great object to produce that unity among its members which could alone present an effectual barrier against the encroachments of regal and papal authority. The memorable words which he uttered when he heard that the Pope was about to visit France, and threatened the excommunication of his bishops, are a sufficient index of his fearless spirit. 'Si excommunicatur venit, excommunicatus abit,' if he comes to excommunicate, he will return excommunicated.'

The principal works not alluded to in this article, are 1st, 'A Treatise on the Duties of a King,' addressed to Charles the Bald. 2nd, 'On the Ordal by Water,' which practice he attempts to authorize by quotations from Scripture, and which unfortunately proves that he was not superior to the superstitiousness of the age. 3rd, 'On the Rights of Metropolitan Bishops.' 4th, 'On the Translation of Bishops and on their Duties.' 5th, 'On the Council of Nices.' 6th, 'On the Nature and Sanctity of Oaths.' besides several letters and 'Capitularia.' His works have been collected in two volumes folio by the learned Sirmond, Paris, 1645, and another volume was published at the same time.

The following are the principal authorities which have been consulted, and may be referred to for a fuller detail of his life. Fleury, Mabusem, and Waddington's Eccles. Histoire des Popes, vol. ii.; Mem. des Sav. de l'Acad. des Inscriptions, tom. ii.; Mabusem, Hist. de France, tom. ii.; Mabusem, Hist. de France, l. ii. c. 3; and Guizot's Sixth Lecture on Modern Civilization.

HINDOEO ARCHITECTURE. (Heronius, P. C., p. 235.)

HINGE, a kind of joint, usually made of iron or brass, upon which doors, gates, shutters, box-covers, &c., are made to turn in the act of opening and shutting. Hinges are constructed in a great variety of forms; but in most of the common kinds the action is that of a hollow cylinder working round a fixed central pin. Without pretending to describe the varieties so familiar to every one, we may be content with a few of the more important deviations from the ordinary form, referring to Heber's 'Engineer's and Mechanic's Encyclopedia' for fuller details. In Collinge's patent hinges, which are made of wrought iron, no peepholes are provided for the vision of the person using the gate; the principal rubbing action is between a hollow cap and an accurately turned sphere, formed, as it were, upon the end of the pin; a cavity being provided for the reception of a supply of oil to prevent the formation of rust. A somewhat similar hinge, another celebrated manufacturer, who has displayed his ingenuity especially in designing hinges for unusual and apparently impracticable situations, in rendering them much lighter in weight than usual, in such a manner that they would be a disengagement, and for contriving invisible hinges for situations in which it is desirable to conceal the hinges altogether, is the inventor of the rising hinges so frequently used for hanging room-doors in houses of superior character.
In ordinary door-hinges the hollow cylinder which works round the axis or central pin is divided transversely into three, or more portions: one or more of such portions being attached to and forming part of that leaf or half of the hinge which has become accustomed to being drinking water. A portion of this form part of that half of the hinge which is screwed to the door-post. In the rising hinges a similar arrangement is followed; but instead of the hollow cylinders being divided transversely at right angles, they are divided by spiral or rather helical lines. The result of this contrivance is, that when the door is opened it is lifted up from a little below the floor by the sliding upon one another of the inclined helical surfaces, so that the lower edge of the door may lie very close to the floor, it rises, when opened, to a sufficient height above the floor to allow its lower edge to clear the carpet. Another advantage of this kind of hinge is, that the weight of the door acting upon the inclined rubbing surfaces of the hinges, causes it gently to close itself so soon as the hand is removed from it; but as this might in some cases prove inconvenient, it is usual to cut a portion of the helical curves away, so as to form two horizontal planes which come opposite to each other when the door is opened to about an angle of 90°, or so as to form a right angle with its position when closed. By this arrangement the door retains its disposition to close whenever it is not opened more than 60° or 60°, which is as much movement as is usual upon a person entering or leaving the room, but will stand open if opened to or beyond this angle. In the lower part of the hinge, a sufficient friction to cause it to close steadily and quietly. In some cases a small spring is attached to hinges of this description, to aid in the closing of the door when it has been opened but a little way. Hinges of this kind are not only used for doors of buildings, but are also used for the doors of public offices, where it is desired to render the closing of the door both certain and quick. For such doors, hinges which will open in either direction and cause the door to spring back to its original position are often used. In connection with such spring hinges, we may notice Hebert's contrivance of a hinge for external shutters, in which a spring catch or detent is employed to hold the shutter open, that of the door being needful to release the catch before the shutter can be closed.

One of the most curious contrivances of the hinge kind is that which Hebert describes as Whitechurch's patent hinge, the details of which are so complicated to be explained without several illustrations. We can only state that it is an apparatus by which doors or windows may be opened at pleasure either on the right or left hand, or by which, in other words, either edge of the door may be made, at pleasure, the opening edge. A handle is fixed near to each side of the door or window, by turning which the required portion of the door or window is caused to open. This handle being to disconnect or release the door from the style or post near to which it is placed, and at the same moment to complete its hinge-like connection with the opposite side. The door, therefore, in opening, is only turned for a short distance, the door is stated to be even more securely hung and better supported, and capable of turning upon its hinges with greater facility than one hung in the common way; and it cannot be turned in the wrong direction. For these reasons, the inventor (Dr. Le theatre) claims for his invention a very great advantage. Such a mode of hanging doors is recommended for cabins in ships and steam-vessels, and for other situations in which space is very limited and great convenience is required.

Another contrivance for the safety of notices, which is also described and represented by Hebert, is Nettlefold's hinge for the doors of book-cases, by which two adjacent doors opening in contrary directions may be hung without an intervening stop; the two doors being divided together, the hinges resembling that by which ordinary doors are hung, and the axis of this hinge being connected with the edge of a thin partition in the book-case by metal brackets above and below the hinge, the space occupied by which is notched or cut out of the edges of the doors. Doors hung in this way fold completely back, and the hinges do not offer the slightest impediment to the removal of the whole book-case. The hinges are to stand next to the partition, and which, were the doors hung in the usual way, could only be removed by first taking out those which stand adjacent to them.

Hippo ("Hyppo"), a Greek philosopher, who is called by some the father of Cynicism and a follower of Pythagoras, and by others a native of Rhgium, in southern Italy. With regard to his age, some writers have made him a contemporary of Thales, who was even before the age of Thales; but he evidently belongs to a much later time, and was per-

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HIPP has a contemporary of the comic poet Cratinus (about n. c.

450), who ridiculed him in one of his last comedies; further, HIPP mentions the four elements of the physical philosophy of Empedocles in such a manner that we must infer that he is acquainted with Empedocles' treatise "De Quattuor Elementis" (Metaphys. i. 3) does not appear to attach any great value to the philosophical system of Hippo, which in fact was that of Thales, with sundry additions and modifications. He thus appears to have been acquainted with Empedocles' doctrines, which, however, owing to its insignificance, appears to have fallen into oblivion at a very early period, and scarcely any fragments of it have come down to us. Clemens of Alexandria (Cohort. ad Gent. vol. i. p. 48, ed. Potter) has preserved an epigram of Hippo, which is also printed in the editions of the Greek Anthology. (Lamblichus, De vita Pythag. 36; Sextus Empir. Pyrrhon. Hyp. iii. 90, ad loc. Mathen, ii. 301; Schol. ad Aristoph. Nub. 97; compare the Antiqu. Geschicht. der Griech. Römischen Philosoph. vol. i. p. 121, &c.; Bakhuisen van den Brink, Varia Lectioea in Historia Philosophiae Antiquae. 36-50. HIPPODROMAS (from ἱππόδρομος, a horse, and ἡπόδρομος, food), a genus of plants belonging to the natural order Labiaceae. It has the limb of the calyx 5-parted with linear segments; the corolla is 5-lobed, the segments nearly equal; the stamens-tube projecting, completely monadelphous and synangyous; the stigma simple, the capsule 2-celled, 2-valved, many-seeded. H. longiflora, only a species is there. It is an herbaceous plant, with short axillary pedicels, mucronate or coarsely toothed leaves, with long slender white flowers. It is a native of Jamaica, St. Domingo, Cuba, and Martinique, in damp places and by the side of streams. This is one of the most beautiful of plants. If the juice only accidentally touches the lips or eyes it produces a burning inflammation. Horses are violently purged after eating it. (Don. Gardner's Dictionary; Lindley, Flora Medica.) HIPPOCREPIS (from ἱπποκρέπης, a horse, and σφυρήρης, a shoe, on account of the curved shape of its pods), a genus of plants belonging to the natural order Leguminosae, the tribe Hedysarum. It has dissepiments, stamens, a pelliform stipe style; the legume curved, with numerous 1-seeded joints; the seeds cylindrical or compressed, oblong, curved, fixed to the middle part of the joint and therefore the umbilicus is in the middle of the curve. The species are herbs, or under-shrubs, with unequally pinnate leaves and yellow flowers, which are sometimes solitary and axillary, sometimes sessile, but usually disposed in umbels on the tips of the stems. H. balcanica, Minorca Horse-shoe Vetch, is a shrubby erect plant, with the peduncles longer than the leaves, bearing an umbel of flowers at the apex, the legumes glabrous, a little arched. It is a native of the island of Minorca. It is a pretty plant, worthy of cultivation, but requires the greenhouse in winter. It grows well in a soil composed of loam and peat; and cuttings strike readily under a hand-glass. H. comosa, one of both of the previous species, end is a very showy plant, with peduncles umbelate, their joints round, curved, neither dilated nor bordered, glabrous; the peduncles longer than the leaves. It is a native of Europe, and is found on dry chalky banks in Great Britain. It is also found in the north of Africa.

There are seven or eight more species of Horse-shoe Vetch. They are all worth cultivation on account of their beauty. The perennial species are adapted for rockwork and banks, and may be propagated by dividing the roots. The annual species should be grown from seeds, which may be sown early in spring.

(Don. Gardner's Dictionary; Babington, Manual of Brit. Foray.) HIPPOPHÆA, a genus of plants belonging to the natural order Eleagnaceae. It has dicotyledons with oval scaly bracts. The staminal flowers have a perianth of two leaves adhering by the margin; the stamens have four very short filaments; the pistilliferous flowers have the perigone tubular and cloven at the summit; the style is short, the stigma elongated; the nut 1-seeded, clothed with the large colored berry-like perigone. The only species of this genus is the H. rhomboideus, which is a small shrub found on the east and south-east coast of Great Britain, and other parts of Europe, and in Asia Minor. The berries yielded by this plant are often eaten as a salad both in this

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country and in France. This plant also yields a colouring
matter, which is used for dying yelloe. Although in this
country the berries are innocuous, they seem to exert a dele-
terious influence, or are supposed to do so, in some of the
eastern counties. From the slope of the sea, the Gulf of Bothnia, the
fishing people of this sea have a very pleasant pastime, as it is
favourable to their occupation, and the fishermen of the
Gulf of Bothnia eat them with their fish.

(Dalby, Manual of Brit. Bot.; Burnett, Outlines of Botany.)

HIPPURIS (from Ipes, a horse, and a., tall, from the
resemblance of the stem to a horse’s tail), a genus of
plants belonging to the natural order Holarceae. It has the
calyx, a large, box-like, bulbous calyx-stem; a filiform style lying in a chamber of the anther; the stigma simple, acute; the fruit mucunamentaceous, one-celled. These
species of this genus have been described. Of these, H. vulgaris, the common mare’s-tail, is found abundantly
throughout Europe and North America. It has linear leaves, 6–12 in a whorl, and callous at the point. It is found in
ditches and lakes. In deep water the submerged leaves are
fractured and pulped, and not callous at the points. This
plant is very common in Great Britain in stagnant waters and
slow streams.

(Dalby, Manual of British Botany.)

HIRCIC ACID. This substance was obtained by Chev-
neul from the fat of the goat.

To prepare it, the aqueous product of the distillation of the
liquid separated from the soap made from the fat, is saturated
with barytes. After having evaporated the solution, the dry
salt is decomposed by dilute sulphuric acid; the hircic acid
then floats on the surface of the liquid in the form of an oil.
In dried form it is lighter than water, smells of the goat, is insoluble in water, and forms soluble
salts with potash and barytes. It has not been analysed.

HIRING OF SERVANTS. (Servant, F. C.)

HOLT, Aloysius, was born at Hola near Doonash-
chingen in Baden, June 27, 1859. In early life he visited
Italy and studied the remains of classic art there, and on
his return settled at Berlin, having been appointed preceptor
to Prince Henry of Prussia. In 1869 he became professor of
architecture and the fine arts at the academy of Berlin,
and was subsequently made professor of archaeology at the
University of Berlin. Among his numerous publications are
several special discussions on particular structures, such as the Temple of Solomon, the Temple of Diana at
Ephesus, and the Pyramids of Egypt; but those by which
he will be most generally and longest known are his Bau-
3to., with a folio atlas of plates. This last not only gives a
history of ancient architecture, that of Egypt included, down
to the close of the Christian empire, but also a full account of all the
various classes of buildings. Latterly he was much occupied
in arranging the collections in the Berlin Museum, which
brought him into a literary dispute with his former pupil and
present college director, whose dissertation he afterwards
published in the form of a book. He was a indefatigable
student and remarkable on English art. Hirt died at Berlin June 29,
1837, just two days after entering his seventy-eighth year.

HODADLEY, Benjamin, M.D., eldest son of Bishop
Hoadley (Hoadley, Benjamin, F.C.), was born February
10, 1705, in London. He was educated at Corpus Christi
College, Cambridge, April 8, 1722, and received his degree of
M.D. in 1728. In June, 1742, he was appointed physi-
cian to his Majesty’s household, and in January, 1746, was
appointed physician to the household of Frederick, Prince
of Wales, and he held both offices at the same time. He was the
Lecturer on the Organs of the Respiration, and read at the Royal College of Physicians in London, 1757,
being the Gulstonian Lectures for that year; ‘Oratio Anni-
saria in Theatro Col. Medico, ex Harvei instituted, habitat
die 12 Oct. 1742.’ ‘Observations on a Series of Elec-
trical Experiments,’ 1756, 4to. Dr Hoadley is now known
chiefly as the author of ‘The Suspicious Husband,’ 1747, a
breezy comedy, full of incidents of intrigue, in which Gar-
field, the gentleman farmer, is punished for his performance of the
character of Ranger, as Elliott was also in more recent times. Dr. Hoadley
died August 10, 1757, in his house at Chelsea. His brother,
the Rev. John Hoadley, LL.D., born October 8, 1711,
died May 31, 1784, was the bishop of Lichfield, was the
author of several poems in Dodsley’s Collection, and of five
drastic pieces, which are now forgotten. He published
an edition of Bishop Hoadley’s Works, London, 1773,
3 vols. folio

HOANG-HAI, or WHANG-HAI. The Yellow Sea, is
a large Mediterranean sea, which runs into the eastern
coast of Asia, being enclosed on the west and north by China Proper,
and on the east by the Peninsula of Corea; on the south it
is divided by the channel of Tsing-tao, and on the north it
is separated from the Yellow Sea of Corea by the strait of the
Straits of Japan, which is the southern entrance to the Yellow
Sea. It is separated from the Sea of Japan by the islands of
coreana, and its eastern boundaries are the coast of Japan and
the Kurile group of islands. The sea is about 760 miles long,
and about 200 miles wide. It is bounded on the north by the
coast of Corea, and on the south by the coast of China. It
is divided into two parts by the channel of Tsing-tao, which
is about 120 miles wide. The sea is shallow, and its
water is clear and of a yellowish tint. The climate is mild,
and the winter season is short. The sea is navigable for
small vessels, and its fisheries are abundant. The

(Hadow, Manual of Brit. Bot.; Doutte, Outlines of Botany.)

The Gulf of Bothnia extends in length from west to east
somewhat more than eight hundred miles from the shores of
the Gulf of Petchel, near the mouth of the river Peho, to
the coast of Corea, at the back of James Hall’s Island;
and it is divided into two branches by a narrow promontory,
middle by a widely projecting peninsula, which juts out
on the northern coast, and may be called the Peninsula of
Leso-tea, as it forms a part of the province of that name.
The strait which lies between the most southern point of this
peninsula and the northern shores of the Province of Shan-
tong is about fifty miles wide, and it contains numerous
small rocky islands, so that it would appear that at some remote
period the Peninsula of Leseo-tea was united to that of Shan-
tong. Between these islands are passages which lead to
the most western basin, which consists of two gulfs, that of
Petchel and that of Leseo-tea.

The Gulf of Petchel washes the north-western shores of
Shan-tang and the eastern part of Petchel. These shores
are low, and can only be seen from the deck of a vessel at
the close of the day, and the distance the shore is visible
from the sea along those shores is unusual. At the distance of
ten miles from the beach they vary only between four and a half
and six fathoms, and at twelve miles between six and eight
fathoms. These shores are sandy, and the fisherman’s boat
that remain at anchor from four to six miles off. This part of
the Huang-hai is only navigated by flat-bottomed vessels, which
find shelter in the embouchures of some small rivers. Where
the gulf approaches the above-mentioned strait between
Leseo-tea and Shan-tang, the shores rise higher, and are well
defined. Here a range of mountains stretches from south-
west to north-east at the distance of ten or twelve miles from
the sea, and beyond which the shore is a lower belt of
elevated ground in a state of high cultivation, covered with
many towns and villages, and interspersed with scattered trees
and several extensive woods. Along this coast the soundings
are somewhat deeper than on the other, but not so deep as
might be expected from the bold outline of the land; and there
appear to be some harbours for larger vessels.

The northern portion of the western basin, or the Gulf of
Leseo-tea, is imperfectly known, as the European vessel has sailed
up to its most remote recesses. The shores are rocky and
high, and they increase in elevation and steepness as they
proceed farther north. But in spite of the rocky nature of
the country the navigation is fair, and the adjacent
coast is of moderate depth. Some good harbours for large vessels
are known to exist, and it is supposed that several others may
be found when this portion of the Huang-hai is better known.

The upper part of this gulf is the site of a small
barren and nearly destitute of trees, but between them and
the shores there are many fertile and well-cultivated tracts.

The water in the western basin of the Huang-hai is of
a dirty yellow or green, which colour seems to be derived
from the mud, which constitutes its bottom. There
are a few small islands in this part of the sea, but the group of three
islands, called the Montos Islands, which lie partly in the
strait between the western and eastern basins, are of moderate
to extent and well cultivated and populous.

The eastern basin of the northern portion is very little
known. Only the most southern part of it, that which washes
the north-eastern coast of Corea, has been navigated by Europeans,
and in these parts the navigation is safe, and there are only a few rocky islands. The
soundings are regular and moderate, and there are some
harbours for smaller vessels. The northern unknown part is
represented on the Chinese maps as containing several
extensive groups of islands, especially along the shores of the
Peninsula of Corea, near the characteristic

The most southern part of the Yellow Sea, or that which
lies south of a line drawn from the most north-eastern cape of
the Peninsula of Shan-tang to the coast of Corea at the
back of James Hall’s Island, is a large sandy coast,
which extends from the mouth of the river Hong-ho and the
south-west cape of Corea nearly seven hundred miles wide, but grows narrower
as it proceeds north, being near its northern boundary, barely
more than two hundred miles across. The shores of this part
the Hong-hai are high and rocky, with the exception of a tract of about sixty miles contiguous to the mouth of the Hong-ho on the north, where the country consists of alluvium. From this point the coast is generally low, and may be again left East, and the sea is full of shoals and sandbanks. On the opposite side, along the coasts of Corea, the sea to the distance of fifty or sixty miles from the continent is littered with islands and rocks, which are generally small. Though the number of islands renders the navigation dangerous, and requires great caution on the part of seamen, they contain numerous excellent harbours. The straits which separate the islands are generally from one mile to two or three or even four miles across, and are all close harbours, capable of containing in security all the navies of the world. They form, in fact, an almost endless chain of harbours communicating with each other. They appear to be all inhabited, and therefore must possess fresh water.

Though the Yellow Sea is not visited by European vessels, navigation is very active, as it washes those parts of China Proper which are most populous and best cultivated, and where the manufacturing industry is carried to the highest perfection. Seamen who have connexions with the coasting trade along this coast, or are seen in the harbours, is very great, and sometimes excites the surprise of European navigators; but along the coast of Corea these vessels are rarely met with.

Corea is a country on the south coast of Corea, in the British possession of China; MacLeod, Narrative of the Alcete's Voyage to the Yellow Sea; and Basil Hall, Account of a Voyage of Discovery to the West Coast of Corea, &c.,

The Royal Academy, and sent several works to its early exhibitions. He died at Bath in 1792.

In 1788, the celebrated Captain Cook as draughtsman on his second voyage to the South Seas; and his drawings were published in Cook's narrative. After the completion of this work he went to India, where, under the patronage of Warren Hastings, he resided a considerable time, and returned to London in 1784. About 1790 he made a tour on the Continent of Europe, visiting Russia; and he exhibited a view of St. Petersburg at the Royal Academy in 1793. In 1795, finding that the demand for his pictures was on the increase, he established a bank at Dartmouth in Devonshire, which however broke two years afterwards in consequence of the devastations of the French in Newfoundland. The shop was closed on the death of his partner, the third son of March; and his wife, his third, died a few months afterwards. He was elected a member of the Royal Academy in 1787.

Hodges was not a painter of great ability; in style he resembled Wilson, but with little success; his best works are— a view of Windsor from the great park, and three or four views painted in India. He painted also two or three historical pieces for Boydell's Shakespeare. His last works were two ordinary landscapes illustrating the effects of peace and war, which he exhibited with twenty-three others, one of which was a large view of Falonette's equestrian statue of Peter the Great at St. Petersburg, in Old Bond Street; one was a seaport in prosperity, the other a town in decay, both of which have been engraved, are now in Sir John Payne's collection. Several of the works of Hodges have been engraved; he himself executed a set of Indian views in aquatint, which he dedicated to the East India Company. He published also an account of his Travels in India, with plates.

(Edward's, Anecdotes of Painting, &c., P. C.)
HOERBERG, Fehr, a distinguished Swedish painter, was born in a village of Smaland, in 1746; his father was a private soldier and extremely poor. Hoerberg's youth was spent in poverty, watching the event colored to take a labor. But, and like Giotto's, his first efforts were made with sticks or chalk in the woods when performing his pastoral duties. When only fourteen years of age he entered the service of a painter, when the king of Sweden was in a very small period. However, by the time he was two and twenty years of age, he contrived to learn so much from one painter and another in his own district, that he was enabled to maintain himself by his practice, and in a very short time he came to his nephew the late Earl of Cardigan, who was his sole executer and residuary legatee. A story was circulated about Sir Nathaniel Holland, that when he became possessed of his great estate at Cranbury House, he resided at Cranbury House near Winchester, and he died suddenly in that city on October 15, 1611, aged about sixty-eight. Lady Holland survived until 1625, when she died, leaving personal property to the amount of about £600, 000. It is said that she came to her nephew the late Earl of Cardigan, who was her sole executer and residuary legatee. A story was circulated about Sir Nathaniel Holland, that when he became possessed of his great estate at Cranbury House, he resided at Cranbury House, and that he spent thousands in the repurchase of his own works, for the purpose of destroying them to obliterate the recollection of his ever having been an artist. This story, however, is not generally believed, and the warm execution and distinct from some of his friends, is contradicted also by the fact of his continuing to paint and exhibit, and of his presenting pictures to his friends; it is also absurd to suppose that people of rank would part with the portraits of their relations for a pecuniary consideration to the painter, to enable him to destroy them. The report was no doubt magnified from the fact that he destroyed some of his most celebrated works in his own possession, because he thought that they were not calculated to add to his reputation. All his best works however still exist, but chiefly in private collections. The Marquis Camden, for Sir Nathaniel had contributed three to the exhibition of the works of deceased British artists at the British Institution in 1817—Orpheus, and Garrick as Richard III.; two of his very best works; and Charles, Earl Camden, Lord Chancellor. The following are also attributed to him—Timon of Athens, of which there is a fine print by J. Hall; Virginia, scraped in mezzotint by J. G. Haid; and the death of Mark Antony, engraved by T. Watson. Dance painted many portraits, including both royal personages and his own, and latterly also some landscapes; the last work which he exhibited was 'A View in the New Forest.'

It has been also reported that Sir Nathaniel saved 200,000l. out of his wife's estate, but this report is not true; but he distributed only 30,000l. among his relations, the residue was bequeathed to his widow. These reports have been here noticed, more particularly because they have been carelessly repeated and with considerable asperity by the writer of an article on George Dance in this work. [P. C. S.] They appeared in the 'Gentleman's Magazine' for 1811, and in part, in 1825, but have been contradicted in subsequent editions of Pilgrim's ; upon their insertion in 1894 in the 'Somerse House Gazette,' they were immediately afterwards contradicted in that same work, and an apology was made for their appearance. The statement that Dance and the other artists did not communicate with any of Sir Nathaniel's friends, or that work would have certainly condemned them also.

(Somerset House Gazette, 1894; Gentlemen's Magazine, 1811, 1812; this work) says that the Rooms of the British Institution, from 1818 to 1828.)

HOLLAND, HENRY, holds a high rank among the architects of his own time, and was greatly patronized by George II. He was a member of the Royal Academy of Fine Arts, and was employed in the decoration of the rooms of the British Institution, from 1818 to 1828.)

HOLLAND, SIR NATHANIEL, historical, landscape, and portrait painter, was the third son of Dance, the architect of the Mansion House, who died in 1658, and the younger brother of George Dance, R.A., the architect of Newgate. Nathaniel Dance was the pupil of Hayman, and he studied also a few years at Rome. He was one of the original thirty-six members of the Royal Academy, founded in 1768, though he cannot have been at that time more than twenty-five years of age. He contributed many works to the academy exhibitions as Sir Nathaniel Holland, as well as Nathaniel Dance. He changed his name to Holland upon his acquisition of the property at Cranbury House in 1694, having married Miss Dunker, who was connected with several noble families. This lady was possessed of estates, chiefly in Hampshire, including Netley Abbey on the Southampton river, to the value of 10,000l. per annum. Upon his acquisition of his title, Sir Nathaniel Holland appears to have resigned his academical diploma, from for that time he exhibited as an honorary exhibitor. He represented for some time the borough of East Grinstead; he resided at Cranbury House near Winchester, and he died suddenly in that city on October 15, 1611, aged about sixty-eight. Lady Holland survived until 1625, when she died, leaving personal property to the amount of about £600,000. It is said that she came to her nephew the late Earl of Cardigan, who was her sole executer and residuary legatee. A story was circulated about Sir Nathaniel Holland, that when he became possessed of his great estate at Cranbury House, he resided at Cranbury House, and that he spent thousands in the repurchase of his own works, for the purpose of destroying them to obliterate the recollection of his ever having been an artist. This story, however, is not generally believed, and the warm execution and distinct from some of his friends, is contradicted also by the fact of his continuing to paint and exhibit, and of his presenting pictures to his friends; it is also absurd to suppose that people of rank would part with the portraits of their relations for a pecuniary consideration to the painter, to enable him to destroy them. The report was no doubt magnified from the fact that he destroyed some of his most celebrated works in his own possession, because he thought that they were not calculated to add to his reputation. All his best works however still exist, but chiefly in private collections. The Marquis Camden, for Sir Nathaniel had contributed three to the exhibition of the works of deceased British artists at the British Institution in 1817—Orpheus, and Garrick as Richard III.; two of his very best works; and Charles, Earl Camden, Lord Chancellor. The following are also attributed to him—Timon of Athens, of which there is a fine print by J. Hall; Virginia, scraped in mezzotint by J. G. Haid; and the death of Mark Antony, engraved by T. Watson.
nearly a square in plan, the depth being almost equal to the breadth. The Ionic colonnade screen in front of Carlton House was censured at the time, not for its real deficiencies, but as an architectural absurdity in itself. It was objected as a violation of the picturesque character of the street, and was supposed nothing, whereas at any rate they were essential for the support of their entablature, and the entablature was requisite for connecting together the two gateways; therefore had there not been such open colonnades, it would have been a wall shutting out a view of the portico from the street.

While Carlton House and its fine portico have disappeared without being recorded by any engravings intended as architectural or picturesque emblems of the metropolis, the 'Illustrations of the Public Buildings of London' being both too few and upon too small a scale to serve such purposes), another work of Holland's, for the same royal patron, and which has also disappeared, though in a different manner — namely, the Pavilion at Brighton, as it existed previously to its being transformed into its present shape by Nash — has, unluckily for the credit both of the architect and his princely employer, been preserved in Richardson's 'New Vitruvius Britannicus.' As a residence for the Duke of York, Holland altered Featherstonehaugh House, Whitbould (built by Paine), adding to it the elliptical entrance-hall, on which was originally the 'Great Corridor,' and the staircases, following the designs of John James - this, which was afterwards called Melbourne House and is now Dover House, would have been in every respect a far more interesting and distinguished piece than 'Virgin's Room,' viz. than the preceding one; nevertheless, not only is it omitted there, but has never been edited in any elevation of it, though in such separate form the composition and design was so admirable, and the resource of piercing the colonnade rather than in the building itself, it being too low and upon too insipid a scale for a piece of street architecture, and for its actual situation.

Holland erected old Drury-Lane Theatre, that is, the structure which was begun in 1791, and burnt down in February, 1809; and which was considerably larger than the present one, their respective dimensions being 930 x 165 and 234, 7 x 169, 9 feet. It was designed by Mr. George Dance, and the edifice made scarcely any pretensions to architecture externally. He was also the architect of another building in the metropolis, of considerable architectural distinction, the India House, Leadenhall Street, the credit of which has, rather strangely, been generally given to Richard Japp, who was only the Company's surveyor, and the conductor of the works, the design, and consequently the architecture, belonging to Holland. And it might be in some respects un-usually florid in character, the frieze of the portico (a recessed Ionic hexastyle loggia) being highly enriched, like that of Carlton House, the pediment filled in with sculpture, and its accessories, of course, like the other house.

Of the rest of the façade however is by much too plain and undisguised to accord with such degree of embellishment cons-

The lady who lived in the front room, and threw her head from the window, saying merely horizontal joints, will bear no compari-

son with that classical mode of such decoration which was exhibited by him in the façade of Carlton House and Dover House, and which he used in all his country houses, where the cornices alone being continued all along the rest of the front, for which there is some reason, since otherwise the cornices of the windows would have joined the architrave.

Holland also made alterations in the mention built by Brown [Browns, P. C. S.] at Clarendon, and added the colonnade screen wings to the Assembly Rooms at Glasgow.

He died at his house in Hans Place, Sloane Street, Chel-

He had no children, and never married. He had, if possible, no more reason to live to witness the destruction of his Drury-Lane by fire and that of Carlton House, his finest work, by demolition.

HOLLAND, HENRY RICHARD VASSAL FOX, LORD., was the only son of Stephen, second Lord Holland. His mother was Mary, daughter of John Fitzpatrick, first Earl of Upper Ossory.

Sir Stephen Fox, Knight, distinguished for his magnificence and public spirit, as well as for his great wealth, having in 1705, as the age of seventy-six, married a second wife, the Rev. Charles Hope of Naseby in Lincolnshire, had by her, besides a daughter, two sons, Stephen and Henry, both of whom were created baronets in 1742, the elder being the third son. Stephen became Earl of Ilchester; and Henry, who figures in our political history as the rival of the first Pitt, was, in 1768, raised to the peerage as Baron Holland, of Vauxley, in the county of Wilt, his lady having the year before been made Baroness Holland, of Holland, in the county of Lincoln. Both baronies passed to his descendants.

The eldest son of the first Lord Holland was Stephen, the second lord; his second son was the Right Hon. Charles James Fox, the statesman and orator.

The subject of the present notice was born at Winteralow House, in Wilts, 21st November, 1773. On the 9th of January, 1774, that mansion, a splendid building, was destroyed by fire, and the infant was with difficulty saved from the flames, his mother, who rescued him at the risk of her own life, having, however, in so doing, taken probably the only direction by which she could have made her escape.

On the 1st of October, 1790, he was created a Peer of Great Britain. Lord Holland; on the 24th of the same month, his grandmother Lady Holland; and on the 26th of December in the same year, his father, the second Lord Holland; on which he succeeded to the peerage, when he was little more than a twelvemonth old.

His mother died in 1778, and then the care of the child's education devolved on her brother, the Earl of Upper Ossory. After having been for some time at a school in the country, he was sent to Eton, where he spent eight or nine years, and where George Canning, Mr. Freere, the present Lord Carlisle, and other persons who subsequently rose to distinction, were among his schoolfellows. Upon the death of his father, October, 1790, he was entered as a nobleman at Christ's Church, Oxford; but all that is told of his academical career is that he took the 'very dry' degree of master of arts, in right of his rank, in June, 1792.

It appears to have been before leaving the university that he made his first visit to the Continent, in the course of which he saw Constantinople, Athens, and Greece. In 1795 he returned to Italy; and there, at Florence, in the beginning of the year 1796, first met Lady Webster, the wife of Sir Godfrey Webster, with whom he returned to England in June, 1796, and whom he married the next year, after she had been divorced from her first husband, who obtained 65000. damages in an action against Lord Holland. (See the particulars in the Annual Register for 1797, pp. 10, 11.) After his marriage with Lady Webster, Lord Holland assumed, by sign manual, her family name of Vassal, which however has been laid aside by his children.

He now took his seat in the House of Lords. His first speech in that House was made on the 9th of January, 1798, on the motion for committing the bill for trebling the assessed taxes. He addressed the House both early in the debate, and again at its close, in which he took a prominent part, and his successful reply to Lord Grenville, who, while he complimented the young peer on the ability with which he had spoken, had noticed some of his remarks in a way that was considered to be disrespectful. On the division, nevertheless, Lord Holland found himself one of a minority of six against seventy-three; so that he had early and emphatic experience of the position in which he was to pass the greater part of his political life. He bore also on this occasion a system which he probably carried to a greater extent than any other peer ever did, by entering a long protest against the bill on the Journals of the House. This first of Lord Holland's long series of protests, many of them very able, was printed for the information they contained, was signed only by himself and Lord Oxford (the present peer).

From this date Lord Holland took a frequent part in the debates for the next four years, being at all times one of the most ardent opponents of the administration, and seconding in the Upper House the principal efforts of his uncle Charles James Fox in the Commons. Among other measures which met with his opposition was the union with Ireland, which he contended (8th May, 1800) would both impoverish that country and endanger the constitution of England. A few days before this (on the 8th of April) he had made the usual speech against the British Commercial laws against the Americans, which after the war was defeated by the consideration by a committee of the whole House. This motion, the first of the kind that had been made in the Lords, was got rid of by the previous question without a vote.

Meanwhile, in 1800 before the war was suspended, he
had paid a visit to Germany, and returned from Dresden by Cologne and Brussels, having obtained a French passport from Talleyrand, and liberty to make use of it from Lord Grenville, then foreign secretary. In the summer of 1811, after the peace of Amiens was terminated, with Lady Holland, to Paris, and there was soon after joined by Mr. Fox, along with whom he was introduced to the first council. From Paris to London Lord Holland proceeded through France, to Spain, and they remained in that country till after the breaking out of the war with England in January, 1805, returning home through Portugal by means of passages, though the Prince of Wales had been written to.

He now resumed his attendance in the House of Lords; and his name, as before, appears frequently in the reported debates. He was not admitted to office during the ministry of Mr. Grenville (1802); but on the 29th of August he and Lord Auckland were appointed joint-commissioners and plenipotentiaries for arranging and settling the several matters in discussion between this country and the United States, with Mr. Munro and Mr. Finckney, the United States commission; and on the 27th of the same month he was sworn of the privy council. An arrangement of the differences with America was effected after a long negotiation (with the omission however of the impeachment question); but Mr. Jefferson refused his ratification, and it came to nothing. On the 15th of October, after the death of Mr. Fox, Lord Holland was appointed lord keeper, and held that office for the six months longer that the Grenville ministry lasted.

In 1806, Lord Holland became an author by the publication of ‘Some Account of the Life and Writings of Robert Southey, Esq.,’ in two volumes 8vo. This work, which was reprinted in 1817, when it was extended to two volumes by the addition of an account of Guillen de Castro and other matter, is creditable to his lordship’s taste, and familiarity with the popular parts of Spanish literature, without being very learned or profound. It had the merit, or luck, of leading the way in the revival of that interest in the literature of Spain which has since prevailed to some extent in this country, though it spread more rapidly at first than it has done of late years—a difference to be attributed partly to the allurement of novelty and the perusal held out by an unexplored field, but more perhaps to the political circumstances and events which for a time drew so much attention to every thing Spanish. Lord Holland followed up his Life of Lope de Vega the next year by another octavo volume entitled ‘Three Comedies from the Spanish,’ and in 1808 he edited and introduced by a preface of some length Mr. Fox’s fragment entitled ‘A History of the early part of the Reign of James the Second.’

Outside the interests of the Spanish connection in this last-mentioned year, he hastened once more to visit the peninsula; and he remained there till the latter part of the year 1809. The rest of his public life for many years was a compromise in the course of opposition to the government with which he had set out on his entrance into parliament. He took a leading part in most of the great questions that came before the House of Lords, and participated in his support of Sir Samuel Romilly’s law amendments, by his advocacy of Catholic emancipation, and his opposition to the orders in council, the cessation of Norway, and the detention of Bonaparte at St. Helena. However opinion may differ as to the positive wisdom of his politics, the praise at least of consistency cannot be refused to him. He was one of the stedfast Whigs of the school of Mr. Fox. But in those days the boundaries of party were much more clearly marked than they are now, and there was but little of inconsistency that was possible. He always overran the one camp to the other, changing from Whig to Tory or from Tory to Whig. These two great parties had then a distinct existence, and did not slide off into one another as they do now.

And when the unsuccessful attempt was made through the Marquess Wellesley to effect a union of parties in January 1811, and Mr. Fox’s acceptance of office in the ministry of Lord Castlereagh, it is not to be imagined that he was satisfied upon that principle Lord Holland should occupy the post of First Lord of the Admiralty. Like the majority of his party he supported without joining the ministry of Mr. Canning in 1822. He made what has been called the best speech in introducing the Bill for the repeal of the Test and Corporation Acts to the House of Lords. At last, on the accession of the Whigs to power in November 1830, he became once more a cabinet minister as Chancellor of the Duchy of Lancaster; and this office he held (with the exception of the ministerial interregnum of a fortnight in May 1832, and Sir Robert Peel’s four months’ tenure of power from December 1840 to April 1841) until his death at Holland House in the 52nd of October 1840. He was succeeded by his son, the present Lord Holland.

The only performances which Lord Holland sent to the press before the latter's death were an ‘Admonitory Letter to the Rev. Dr. Shuttleworth in favour of the Catholic Claims,’ 8vo., Lon., 1837, and ‘A Letter from a Neapolitan to an Englishman,’ which is stated to have been privately printed in 1818, and translated into Italian by Orlando Furioso (1827), together with a version of the 25th Canto of that poem, which is stated by Mr. Rose to be the performance of an old schoolfellow, who may perhaps be Lord Holland. As a speaker Lord Holland was more animated than graceful; when he began, in particular, he was usually for some time extremely impeded and embarrassed; and he never rose from this hesitation into any thing like the fine and impetuous torrent of argument or the impassioned declamation by which his relative Mr. Fox, after a similar unpromising outset, used to carry every thing before him. But his speaking had always the great charm of honesty and earnestness; and, so far as it commonly occurs, he knew ever little of what could be called brilliancy, a well-informed and full mind. Lord Holland was much beloved by as extensive and varied a circle of friends as perhaps any man who had lived in the last sixty years. His name, with its earlier history, was during all his lifetime the resort of the most distinguished persons both in the world of politics and in that of literature.

(Gentlemen's Magazine for December, 1840.)

HOLOSTEUM (from 8ar, 'all,' and 8erw, 'a bone,' an antithesis applied to this plant because it is soft and unlike bone), a genus of plants belonging to the natural order Caryophylline, and the sub-order Alatici. It has 5 sepals; 5 petals, toothed at the end; 3, 4, or 5 stamens; 3 styles; a sub-ellipsoidal many-seeded capsule, opening at the end, with 6 teeth. The species of this genus are herbs with nothing to recommend them for use or cultivation. One species, H. umbellatum, is British. It has umbellate flowers, pubescent viscid peduncles, the pedicles reflexed after flowering, the leaves acute, elliptical, or elongated. It is not a common plant, but has been found on old walls and dry places at Norwich, Bury St. Edmunds, Eye, and Yarmouth. (Babington's, Manual of British Botany.)

HOLZER, JOHANN, a distinguished German franco painter of the early part of the eighteenth century, was born at Burgis, near Marienberg in Vincagruen, in the Tyrol, in the year 1709. He was first instructed in the police of painting by the German painter, Marienberg, and Holzer was first instructed by N. Ascer at Meran in the Tyrol. He made here such extraordinary progress that at the early age of eighteen his reputation spread far into Germany, and he was invited by the painter J. A. Merlin, of Straubing in Bavaria, to assist him in some frescoes in the convent church of Oberleiteich. From Straubing Holzer went to Augsburg, where he lived six years in the house of the painter J. G. Bergmiller, from whom he learnt much in the mechanical department of painting, both in fresco and in oil, for Bergmiller was the principal painter in Augsburg at that time, and was much employed. Holzer painted many magnificent pictures of history and portraits; but few, if any, now remain; there is however a collection of twenty-eight prints after them by J. E. Nilson, entitled Picture a Fresco in Zohlius Augustin Vind., &c. Holzer, among the other things, did in Munich, in a peasant decorated beer shop, was a very popular work; and it is spoken of in the highest terms in the letters of J. L. Bianconi and Count Algarotti. The neighbouring peasant girls at that time were extremely adored for his beauty, and formed a model in the forms of their legs were accordingly fully displayed; and Bianconi speaks with enthusiasm of the beauty and life of the young peasant girls in this painting; the figures were above 4 feet in size, and the lines were lively and graceful; the frescoes of the convent church of Schwarzbach near Wurzburg; he obtained the commission to execute them by competition; and they were painted in 1737, when he was only twenty-nine years of age. They are the best works that were...
executed at that time in Germany; and Holzer is by some considered the founder of the new era of German fresco painting. They are however now in a most dilapidated condition; the church being in a ruinous state and the convent is a paper mill. Dr. Weiss, who was not the most impartial of men, in the Convent of Schwarzach in his account of the works of art in Frankfort, though it contains many works besides the frescoes of Holzer, his work is not mentioned by him; they are said to be inferior to those by Holzer. Holzer painted the cupola and ceiling of the church; the subjects represented are—the Glorification of St. Benedict; the Transfiguration; the Pentecost; the Assumption of the Blessed Virgin; St. Felicita and her Seven Sons; the Foundation of the Convent; and the Papal Confirmation of the Foundation. The martyrdom of St. Sebastian is described as the most successful composition.

After the completion of these works, Holzer was invited by the prince bishop of Wurzburg to paint his palace, for which he made the designs, but they were not quite satisfactory to the bishop. He was in the meanwhile invited by the Elector Clement of Cologne to paint the newly established capuchin convent at Clemenswerth, and he accordingly immediately prepared himself for this work. He however did not feel confident to commence it; he died of a fever at Clemenswerth, a few days after his arrival, in July, 1740, at the age of thirty.

Holzer's works are described as successful in every department of art, in invention, form, character, light and shade, and treatment; and the subject matters represented by him have been published in Germany; the first in 1765, at Augsburg, and the last in the Tyrol in 1834. In the latest account of the subject called Johann Evangelist Holzer; see Nagler, Künstler Lexicon.

(Zapf, 'Leben Johann Holzers,' printed in Meusel's Medicines Artistischen Inhalts, 1781.)

HOMOPATHY, the art of curing founded on resemblance, expressed in the Latin expression 'similia similibus curantur.' It is derived from the two Greek words 'σίμως, ' similar,' and 'κατά, 'feeling' or sensation, and hence a condition of body, such as that of disease. According to this law, disease is cured by remedies which produce upon a healthy person effects similar to the symptoms of the complaint under which the patient suffers.

This system of medicine stands in direct contradiction to that founded on the principle of treating diseases by their opposites, 'contraria contrariis curantur,' which has served more or less as a guiding law since the time of Galen. To this last method the disciples of the new school have given the name of Allopathy, from the two Greek words 'ἄλλος, 'other,' and 'πάθος, 'condition.' This distinctive nomenclature will be allowed in this article, as a matter of convenience, and to avoid circumlocution. The proponents of homoeopathy assert the truth of the homoeopathic law, which is directly and actually stated in the works of eminent medical men of different schools and various epochs, and from experiments upon healthy individuals made by the founder of the system and his disciples upon them.

1st. Popular experience has shown that the safest manner of restoring the circulation of a frozen limb is to rub it with snow (similia similibus); warm applications, according to the evidences of the same experience, would cause the destruction of the part affected (contraria contraria).

Again, severe burns are most quickly cured by the use of heated spirits of wine or oil of turpentine, which excite a very similar sensation, although generally a greatly modified degree (similia similibus). Cold applications, although they give temporary relief, are, as is well known, generally followed by increased inflammation and severe after-suffering (contraria contraria), as corroborated by the evidence of John Hunter, Kentish, Sydneyham, and other medical names of high repute.

The homoeopathists also insist that the acknowledged effects of a physician's great discovery is a powerful argument of the truth of the homoeopathic law, since by producing a similar disease an almost perfect immunity from attacks of the small-pox is obtained.

It is not for us however to show by a number of observations collected from the works of different medical allopathic authors, that many drugs recorded by them as curtive in different forms of disease were observed by others, also allopathists, to produce effects analogous to that observed by them for the treatment of the same disease, or in other words, that they acted upon the principle, similia similibus; an instance or two will be sufficient illustration.

The English sweating sickness, which committed such ravages in the year 1485, and for some time baffled the physicians, yielded, according to Willis, to sudorifics; and it is upon record that after the adoption of this mode of treatment very few died of it. Gilibert gives several cases of the consumption, a deep and heavy sleep; and it has, according to the testimony of many allopathic physicians, proved curative in diseases characterized by cold symptoms. Moreover, it is asserted by the homeopathists that the law is recognised by those who, as specifics by the medical profession, of whatever school, act upon this law; for instance, they maintain that Peruvian bark produces mediately the same effects as cinchona, and therefore the marsh fever, and that the well-known efficacy of mercury in syphilitic complaints, and of sulphur in various forms of cutaneous disease, is attributable to the same power (similia similibus), and as above stated, that the action of vaccine matter, as a prophylactic or preventive medicine against small-pox, depends upon the same law.

Assuming, therefore, that the position of the homoeopathists is supported by the arguments which they advance, and that the law upon which specifics act has been clearly ascertained, it would seem to be incumbent upon those who have dedicated themselves to the advancement of the healing art to endeavour, by personal experiment and careful observations upon the effects of medicines upon the human body in health, to add to the numbers of this class of remedies, and in this manner materially to improve the treatment of disease. This view of the subject appears to the author, by the observation of the homoeopathists and other great names in medicine. Dr. Alison, professor of the University of Edinburgh, observes, 'The increasing efficacy and usefulness of homoeopathic medicines has been manifested by which may be expected in the discovery of specifics which may counteract the different diseased actions of which the body is susceptible as effectually as the cinchonas counteract intermittent fever, citric acid the scurvy, or vaccination the small-pox.'

Sedly, Dr. Samuel Hahnemann, the founder of this system of medicine, being struck, as noticed in his life [Hahnemann, P.C.S.], with the close analogy between the symptoms produced by Peruvian bark and those of the forms of disease for which it was considered a specific, and having obtained similar results from other medicines tried upon his own person, was led to the discovery of the homoeopathic law; and he, believing that the mode of operation of all remedial agents was in perfect harmony with this principle, by repeated experiments upon himself and some medical friends, converted to his opinions, first determined their direct action and then employed them in disease. The practical results obtained by himself and the physicians of his school are appealed to by them as a further confirmation of the truth of their fundamental law.

The extremely minute quantities in which the remedies are administered seem to form a marked difference between the homoeopathic and all other schools of medicine. The homoeopathists hold that the dose used in the treatment of the disease is to be determined by the physician at the bedside of his patient, and that in the application of the homoeopathic principle to the treatment of disease, it was soon found that remedial agents in that dose used were too energetically upon a frame already predisposed to their influence by the affinity existing between their medicinal effects and the morbid signs of the disease; and hence a gradual diminution was made in the quantity of the medicine exhibited, in order to approximate to that amount which might exert its full curative power without aggravating the sufferings of the patient by an excess of medicinal action.

The result has been, the homoeopathists adopted the practice of determining the dose used in that present in use, which perhaps more than any other cause, from its discrepancy with generally received opinions, has prevented any impartial investigation into the principles of the new system by the profession at large.

Homoeopathic numbers in its ranks many medical men who had obtained high repute and proficiency in the other systems before they embraced the principles of homoeopathy, and seems to be more or less diffused in all parts of the world, if we may form any opinion from its literature, which comprises books published in British, French, Spanish, Italian, and Portuguese. The system has also adherents in North and South America and Asia. The great bulk however of the medical profession in these countries are to one degree or another opposed to the formation of the system.

HOMICIDE [MURDER, P.C.]

HONE, WILLIAM, was born in 1779 at Rath, where
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his father is stated to have been an occasional preacher among the dissenters. He is said to have been rigid in his religious views, and that he would not suffer his son to be taught to read out of any other book than the Bible. William was placed at the age of ten in an attorney's office in London; but his father found that he had attained to manhood for himself to some reforming society and began to take part in what he seems to have thought very objectionable politics, removed him to another master at Chatham, with whom he remained for three years. He was then returned to London, and was engaged for some time as clerk to an attorney of Gray's Inn; but at last he quitted the law, and, having married, set up in July 1800 as a bookseller, with a circulation of about one thousand. For some time he moved to what was then called St. Martin's Churchyard, in the neighbourhood of Charing Cross; and here he appears to have remained stationary for several years, although it is stated that he was once burnt out, and also underwent many vicissitudes in business. He had always been fond of literature, and in 1806 he brought out his first publication, an edition of Shaw's 'Gardener.' After this he devoted much of his time to an attempt which he made in conjunction with a friend to establish a savings bank in Blackfriars Road, which, however, failed. He then entered into partnership as a bookseller with this friend, Mr. John Bone; but the speculation ended in bankruptcy. When he got upon his feet again he established himself in a shop in May's Buildings, whence he removed to High Street, Bromley; and here he appears to have remained till 1811, when on the retirement of Mr. John Walker he purchased his bookseller's business in Lime Street, which is called the 'Trade Auctioneer,' and placed in a counting-house in Ivy Lane. Before this he had been employed to compile the Index to the new edition of Lord Berners's 'Translation of Homer,' a work which was now taken to the investigation of the abuses in lunacy asylum, he soon became bankrupt again. The date is not given in the account from which our abstract is derived; but it is stated that he had three children, whom he took to a humble lodging in the Old Bailey, and endeavoured for a time to support by contributing to periodical publications, especially the 'Critical Review' and the 'British Lady's Magazine.' At length, however, he found means to set up once more as a bookseller in a small shop in Fleet Street. Here he was again unfortunate in having his premises twice broken into and plundered, much of the stock that was carried off having been borrowed; but he seems to have weathered these disasters; and in 1815, it is stated, he became publisher of the 'Traveller' newspaper. In that year he exerted himself most praiseworthy humanity and spirit in the investigation of the case of the unhappy Elizabeth Fenning, executed on a charge of poisoning of which there can scarcely be a doubt that she was innocent; and he published a very striking able report, in which he added his own name from the title-page (except as the publisher), and giving the literary credit to a Dr. John Watkins, who only contributed three letters, forming the least interesting part of the report. The volume professes to be printed for William Hone, 55, Fleet Street. In 1816 he commenced a weekly paper called 'The Reformer's Register,' but it does not seem to have gone on long. The next year, however, he brought himself into great notoriety by a series of political satires, published as separate pamphlets, which had immense success, the effect partly of their literary merit, partly also of the wood-cut embellishments from the clever and humorous designs of Mr. George Cruikshank, whom they first made generally known to the public. One of them, 'The Political House that Jack Built,' went through fifty editions, besides producing a host of imitations. Together with another, 'Harlequin's Assistant,' he held an encircling attack upon the since defunct daily morning paper called 'The Times,' its editor Dr. (afterwards Sir John) Stoddart, and the Constitutional Association, on 'Bridge Street Gate.' In 1817 he published his 'Man of Feeling,' which has sold to the amount of two hundred and sixty thousand copies. The volume turned out the most productive for the author were three composed in the manner of parodies upon various parts of the Book of Common Prayer. For the printing and publishing of these parodies Hone was sentenced to death in three severest indictments in the Court of King's Bench, on the 18th, 19th, and 30th of December, 1817; the first day before Mr. Justice Abbot (afterwards Lord Tenterden) to be continued and tried before Lord Ellenborough. He defended himself on all the three trials (which were before special juries); and, notwithstanding the best exertions of the bench to procure a con-
HONG

island from east to west is stated to be about eight miles; but its breadth is very irregular, and varies from about six miles to two miles. The coast-line forms a succession of small bays and headlands. The chief bays are Victoria Bay, with its fine sandy beaches, in the north; and Victoria Harbour, opposite both the town of Victoria and Victoria Harbour itself. The Victoria Harbour, on the other hand, is a small body of Chinese police. The command of cheap labour to any extent has been one great cause of the rapid progress of the town of Victoria. In June, 1841, when the British forces disembarked in the Bay of Hong Kong, there was no house on the island fit for the residence of Europeans, and Sir H. Pottinger, the resident missionary, lived, with his family, in a tent. During the first months that the settlement remained between tents and huts were erected; but in the month of August, 1841, the site of Victoria was still covered with brushwood. Within a year after the first house was built, there had been constructed regular streets and bazaars for the Chinese, numerous large storehouses, substantial wharves and jetties, two European hotels and billiard-rooms, and various public buildings. The government had begun the formation of an excellent road along the front of the harbour at the foot of the hills, which was carried to a distance of four miles; and it has since been extended, and other roads have also been made, and bridges erected. In consequence, the road between the beach and the base of the mountains, the town necessarily stretches in a line, which is about three miles in front of the harbour. The distance from one end of the town to the other is about five miles, and the site is so situated as to be in some other situation than to be desirable. In July, 1844, a liberal arrangement was made with a body of Chinese shopkeepers, who had been allowed to settle in a district which is about the centre of the town and the centre of the European town, and they were removed to another part of Victoria, where a large number of their countrymen were already settled. The government does not grant land in perpetuity, but assigns it on leases for seventy-five years; and there is a clause under which it is to be given up at a valuation assessed by twelve jurors, on oath, if required for public purposes. In 1844 the government derived an income of 900,t. from ground-rents; and its revenue from this source was rapidly augmenting.

Early in 1845 the governor of Hong Kong legalized the opium trade. In March the privilege of renting the island was granted to a mercantile house at 730 Spanish dollars a month. All the houses in which opium is sold must adjoin the street, and they may be open from day-light till ten in the evening, except on Sundays, when they are to be closed. No person is to be admitted into these houses with any kind of weapon or edged tool. There is a tax on salt, and a duty of 24 per cent. on sales by auction. Victoria is a free port, and, like Singapore, its prosperity must depend upon its commerce being freed from all restrictions which can properly be dispensed with. In May, 1845, the currency was regulated by a proclamation which had previously been sanctioned at home by the privy council. The gold or silver coin was to be equivalent to 29s. 2d.; the East India Company's rupees, coined since September, 1845, to 1s. 10d.; Spanish and Mexican dollars 4s. 2d.; and 226 cash are declared to be equivalent to 20s. 3d.

(Bernard, Voyages and Services of the Nemi, London, 1844; McPherson, Two Years in China, 1842; Lock, Campaign in China, 1848.)

HONTHORST, or HUNDHORST, GERHARD, called by the Italians Gherardo dalle Notti, from his night and candle pieces, was born at Utrecht in 1592. He was the pupil of A. Bloemaert, studied some time in Italy, and was engaged for six months by Charles I., in England. He painted Charles's sister, the Queen of Bohemia; the portrait is now at Hampton Court. There are also at Hampton Court—James II., when young; the Duke of Buckingham and family; and a large painting on the queen's staircase, of Charles I. and his queen, as Apollo and Diana, sitting in the clouds, and the Duke of Buckingham below as Mercury, introducing the Arts and Sciences to them, while several game are driving away Easy and Malice. For these paintings Honthorst received 3000 florins, a service of plate complete for twelve persons, and a beautiful horse. Honthorst was the favourite painter when the Queen of Bohemia and her sister were in his native country. In 1637, he was elected as a court painter to the Prince of Orange. He died at the Hague in 1660. He had a remarkable number of scholars, especially among the Dutch; his pupils, as we learn from the register of his pupils. His style of execution is much like that of Guercino; his pictures occur frequently in European galleries.

Vor. II. G.
Hood, in this situation, became acquainted with several persons who have distinguished themselves in English literature, and he is said to have contributed to the "London Magazine," with Lamb, Carey, Croker, Cunningham, Bowring, Barton, Haslitt, Elton, Hartley Coleridge, Talford, Soane, Horace Smith, Reynolds, Poole, Clare, Benyon, and others. With Lamb especially it became of great intimacy, which continued till Lamb's death.

Hood's first publication in a separate form was "Odes and Addressas to Great People," in which he was assisted by his brother-in-law, J. H. Reynolds, and which was brought out anonymously. "Whims and Oddities," published in 1836, in small 8vo, consisted chiefly of his contributions to the "London Magazine," with some additions. His next work was in prose, "National Tales," sm. 8vo, which was followed by "The Plea of the Midsummer Fairies, Hero and Leander, Lyceus the Centaur, and other Poems," sm. 8vo, 1837, a volume of serious poetry which obtained praise from the critics, but little favour from the public. His experience of the unpleasant truth that "Those who live to please must please to live," induced him to have recourse again to his lively vein. He published a novel, "D.IsNulla," in 1838, and a second novel, "The Principal Mill," in the third series in 1828. He commenced the "Cosmic Annual" in 1829, and it was continued nine years. In the same year his comic poem of "The Epping Hunt" came out, and excited much notice; it is an interesting poem, and a view of the city and its scattered suburbs. He was for one year editor of "The Gem," and wrote for it his poem called "Eugene Aram's Dream."

In the spring of 1831 Hood became the occupier of a house called "Leicester House, belonging to the proprietor of Wanstool, in Essex, near which it was situated. While residing here he wrote his novel of "Tyneley Hall." Pecuniary difficulties compelled him to leave his pleasant residence. The "Hobbit," a comic meta. "Tyneley Hall" is dated Lake House, Oct. 20, 1834. He left it in 1835.

The "Cosmic Annual" having terminated in 1837, Hood commenced the publication of "Hood's Own," in a series of monthly numbers, in 8vo, 1838. It consisted chiefly of selections from the prose and poetry which he had published in the series of the "Cosmic Annual," with several additions. A portrait of himself, for which he sat at the request of the publisher, is attached to the work, and is, as he says himself, a faithful likeness.

Hood went to the court for the benefit of his health, but while in Holland the unholy air of the marshes produced a result so disastrous as to balance all his success. He finally succumbed to his misfortune in the spring of 1835, and the nation mourned the loss of a poet. His "Hobbit," "Cosmic Annual," and "National Tales," are valuable contributions to literature.

"The Hobbit" is dated "Leicester House, London, 1834.

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In 1834 Hood started his last periodical, "Hood's Magazine," and continued to supply the best of its contributions till within about a month before his death. Those who have read the work, and have a taste for wit, humour, and character, will not readily forget his "Schoolmaster's Assistant." Mrs

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HOOD

(Sanford, Tuteni Acadeae, &c.; Walpole, Anecdotes of Painting, &c.)

HOOD, THOMAS, was born in 1798, in the Poultrey, London, where his father was a bookseller, of the firm of Vernon and Bingley. Thomas Hood was sent to a school in Tookenhouse Yarn, in the city, as a day-boarder. The two maiden sisters who kept the school, and with whom Hood took his dinner, had the odd name of Hopedash, and so the young poet was a regular visitor to "Mr. H.' and who subsequently became the prototype of Charles Lamb's unsuccessful farrce called "Mr. H." Hood was afterwards sent to a preparatory school, and in due course transferred to a school in the neighbourhood of London, but derived little benefit from either.

In 1811 Hood's father died, and soon afterwards his elder brother died also. Thomas Hood being then the only remaining son of the widow, she was anxious to have him near her, and recalled him home. In 1812 she sent him to a day-school. His account of this school and its master is so characteristic as to be worth extracting from his "Literary Reminiscences" ('Hoan's Own,' p. 292). "In a house, formerly a suburban seat of the unfortunate Earl of Essex, over a grocer's shop, up two pairs of stairs, there was a very select day-school, kept by a decayed, Domincan, as he would have called it in his native land. In his better days, when my brother was his pupil, he had been master of one of those wholesale concerns in which so many ignorant men have made fortunes, by favour of high terrorism, or the obnoxious parties, and cherished little benevolence. As our worthy Domincan, on the contrary, had failed to realize even a competence, it may be inferred, logically, that he had done better by his pupils than by himself; and my own experience confirms the fact that he attended the interests of his scholars, however he might have neglected his own. Indeed he less resembled, even in externals, the modern worldly trading schoolmaster than the good honest earnest oiled pedagogue—a pedant perchance, but a learned one, with whose teaching was a labour of love, who had a proper sense of the dignity and importance of his calling, and was content to find a main portion of his reward in the honourable profession of his calling, a provision out of which he suppers with his coffee, and enters the national tarian. A quaint carved highbacked elbowed article, looking like an émigré from a set that had been at home. In an aristocratical drawing-room under the ancient régime, was his professorial chair, which, with his desk, was appropriately elevated on a dais some inches above the common floor. From this moral and material eminence he cast a vigilant yet kindly eye over some dozen of youngsters; for adversity, sharpened by habit of parting with friends, had not sourcd him, or mellowed a single tinge of the peculiar red-streak complexion so common to the healthier natives of the north. "In a few months my education progressed infinitely farther than it had done in as many years in London. He was superintendent and assistants. I picked up some Latin, was a tolerable grammarian, and so good a French scholar that I learned a few guineas—my first literary fee—by revising a new edition of "Paul of Virginia" for the press. Moreover, as an accountant, I could work a nominen bonus, that is, a good sum."

From this school he was removed to the counting-house of Messrs. Belcher, Bros., Russia merchants, Wannford Court, City, but his health soon began to fail, and he was sent to a Scotch snuc to Dundee, and consigned to a female relation, who otherwise refused to take charge of him, and even reshipped his luggage, and had sent him here. He had not played her an evasive trick, and frustrated her intentions. He immediately took lodgings for himself in Dundee. He was then fifteen years of age, and seems to have been left entirely to himself. For the first while he was not idle, but had no taste for dissipation, but took great delight in reading, as well as in rambling, fishing, and boating. His health gradually improved, and, after remaining two years at Dundee, he returned to London. He engaged for a short time in the sand, an engraver, who was his uncle, in order to learn his art, and was afterwards with Le Keux for the same purpose.

In 1821, Mr. John Scott, then editor of the 'London Magazine,' gave him a small salary for his contributions to its pages. He read extensively, and was always addressed with Le Keux for the same purpose.

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Gardenier,' and his novel of 'Our Family,' which was inter-
rupted by his last illness and death: the last chapters were 
in fact written by him when he was propped up by pillows in 
bed. He had the conception, a short time before his death, 
of a novel, 'A Song of the Shirt,' which was offered to him by Sir Robert Peel, transferred at his own re-
quest to his wife. After a lingering, which continued four 
days, he died, May 8, 1846. He was buried on the 10th of 
May in Kensal Green Cemetery, his wish to die un-
disturbed being fulfilled.

Hood left two children, a girl and a boy, of whom the girl 
is the eldest, and is now (1845) about fourteen years of age. 
She is very fair, lively, and attractive, and it is believed she 
will raise a fund for the benefit of the widow and children.
The amount already realized (Nov. 1845) is between 1400L. 
and 1500L.

Hood was undoubtedly a man of genius. His mind was 
stored with a vast collection of materials drawn from a great 
variety of sources, but especially his own observations; and he 
posessed the power of working up those materials into combi-
nations of wit and humour and paths of the most original 
and varied kinds. His vigilance of observation must have been 
extraordinary. The appearances of nature, the forms and usages 
of society, great diversity of characters, all arts, professions, and 
trades he was in his mind to supply the demands of his rapid 
subtle and versatile imagination. He has wit of the highest 
quality, as original and as abundant as Butler's or Cowley's, 
drawn from as extensive an observation of nature and life, if 
not from a larger one. His genius was tempered with the 
richness of humour of which Butler had little and Cowley none. 
His humour is frequently as extravagantly broad as that of 
Rabelais, but he has sometimes the delicate touches of Ad-
donis. As a punster he stands alone. He is peculiar in his 
instinct of double meanings of words, a low kind of punning 
of which minds of a lower order are capable, and with which his 
initiators have defiled English comedy and comic literature, 
but of which he has done things which are impossible. His mean-
ings of sense in such a manner as to produce the most extra-
ordinary effects of surprise and admiration. His power of 
exciting laughter is wonderful, his drollery indescribable, 
immatelible. His pathetic power is not equal to his comic, but 
it is very great. In some of his 'National Tales,' as well as 
in his singular poem of 'Eugene Aram's Dream,' he produces 
an effect upon the feelings which is sometimes little less than 
sublime. His 'Song of the Shirt,' which he wrote a short 
time before his death, was a burst of poetry and indignant 
passion by which he produced tears almost as irrepresentably as 
in other cases he produces laughter.* In his 'Plea of the 
Midsummer Fairies, Hero and Leander, Lycidas, the Centaur, 
and other Poems,' he supports a poetic character quite different 
from those in which he usually appeared. Without a trace of 
any affectation or portentousness he plays a graceful and 
delicacy of fancy, a tenderness and 
sweetness of feeling, a choice of diction, and beauty of versifi-
cation, which render these serious poems exceedingly delight-
ful. They are rich in thought, and grafted upon the 
form and structure, it may be inferred that it cost him much la-
bour, if not much time. In extension of the neglect of the 
public, it may however be observed that such poems can never 
be appreciated by the public. His poems are not intended with 
the elaboration of sense with which others have combined them; 
they are allegorical and mythological, and entirely out of the 
limits of actual existence. As a novelist Hood has considerable 
merits. He has a flowery and the exuberance of his imagination to 
such a degree as to interrupt the course of the narrative, and, 
by diverting the reader's attention, to weaken his interest in 
the story. Some of the characters, too, are injured by what 
may be called the intrusion of his wit, by which both the 
thoughts and language are often rendered less interesting. 
These objections however are much less applicable to 'Our Family' 
than they are to 'Tynley Hall.' They are defective as novels, 
but they are mixtures of wit and humour.

The rule but graphic and humorous sketches by which 
many of his comic works are illustrated, are for the most part 
very slightly connected with the works to which they are 
annexed, and seem to be introduced merely for the sake of 
the whim, as some pun or odd fancy occurred to him.

The moral tendency of Hood's works is excellent. In 
the indulgence of his spirit of fun he is anything but strict-laced 
as regards the introduction of images and phrases which a 
fastidious person might call vulgar or coarse; but an indelent 
curiosity, or use of coarse description, or even a genteel

* In the course of the year 1845 public feeling had been much excited 
by cases of 'smut' and 'sentiment' which came before the London police mag-
istrates, sometimes for very trivial causes. Daring the smut case, the law rate of 
sentencing was increased, and during that year village women were made 
made for their complaints. Taking advantage of a market which was not yet 
put with the most unchristian and brutal of these women were done, should be noted 
that the process was much more frequent than was required in order to 
organise support. Hood was as well of the 'sentiment' of his proceedings. Hood's sympathy was excited, and the 'Song of the Shirt' was the result.

HOOK, THEODORE EDWARD, was born Septem-

He was the son of James Hook, a musical composer of some 
celebrity in his day, by his first wife (Miss Madden), a beau-
tiful, accomplished, and excellent woman. There was only 
one other child by that marriage, Dr. James Hook, dean of 
Worcester, who was born in 1773, and died February 6th, 1828. 

Dr. Hook married a daughter of Sir John 
Sibthorp, a Quaker, of Sibthorpe, near Histon, in 1797; and wrote 
two musical pieces, 'Jack of Newbury,' 1796, and 'Diamond cut 
Diamond,' 1797, which were never printed; and two clever 
poems, 'Pen O'wens,' 1797, and 'Percy Mallovy,' 1798. 

Mr. Theodore Hook's mother died in 1802, while he was yet a school-
boy at Harrow; his father did not send him again to school after 
the funeral; and not long afterwards he married again. 

Theodore Hook was always remarkably clever. He 
advanced, as an ear performer on the piccolo, a 

hook, having a strong and sweet voice, and sang a 

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declared that 'something must be done for Hook,' and late in 1812 something was done for him;--he was appointed Lieutenant-General and Treasurer of the Colony of the Mauritius, with a salary and allowances amounting to nearly 2000l. a year. He reached the island on the 9th of October, 1818, being then only twenty-five years of age.

The climate, the society, the amusements, everything delighted him, and he indulged in the most lavish expenditure. Ten years later, in 1827, General Hall, who had sailed for England, and Major-General Hall was sworn in as deputy-governor during his absence. An examination of the accounts and state of the treasury took place, and the report of the auditor declared that everything was in order. Afterwards, however, a man of the name of Allan, who was in the treasury department, made a declaration that he knew and had long known that there was a deficiency of 27,000 dollars. Further examinations took place, more deficiencies were discovered, and the result was that Hook was arrested on the 9th of March, 1818; all his property was seized, and he was sent back to England in custody.

The ship reached Portsmouth in January, 1819, and the documents were submitted to the law-officers of the crown. The attorney-general's report was, that though Hook might be liable to a civil prosecution for debt, there was no apparent ground for a criminal prosecution, and he was set at liberty with only two gold mohurs in his pocket.

He took a small cottage in Somers Town, and formed connections with newspapers and magazines, thus being enabled to supply himself with the present means of subsistence. He lived in obscurity, and was known only to a few of his old associates, such as Matthews, Terry, and Tom Hill.

In 1819 he hitched his horse, Scott was in London, and, dining one day with his old friend Terry, met there Matthews, and, for the first time, Hook. The inquiry into Hook's defalcation was still before the audit-board, and the proceedings were represented to Scott as a cruel persecution; he was much pleased with Hook's conversational powers; they were both staunch Tories; and Scott having soon afterwards been applied to by a nobleman of influence to recommend an editor for a provincial newspaper, named Hook. Hook, however, was not destined for provincial celebrity. The 'John Bull' newspaper, established, was published, with Hook for its editor. The career of the 'John Bull' is well known; its attacks upon Queen Caroline and her supporters, its virulence, its personalities, and the talent which raised its circulation to so great a height.

Hook, in its prosperous state, received full 2000l. a year from it; and though its circulation gradually diminished, he derived a considerable profit from it up to the time of his death.

Meanwhile the Whigs took care that the inquiry before the audit-board should not be dropped; and the result was, that at the first balance found against him was 30,000l., which on the requisition of the government was reduced to the extent of 12,000l.

Hook admitted at an early date that the deficiency was 9000l., but afterwards asserted that a strict scrutiny would have struck off 3000l. from his account. There is no proof of a fraud on the part of Hook; but there is proof that he himself and his officers kept the treasury books with the most culpable and scandalous carelessness, and that the keys of the treasure-chest were frequently lost with underlings while he was absent on pleasure excursions. In August, 1823, he was arrested under a writ of Exchequer, his property was sold, and realized about forty pounds, and he was taken to a spangling-house in Shire-lane, Fleet-street, where he remained till April, 1824, whence he was transferred to the Rules of the King's Bench, and he remained there till May, 1825, when he was released from custody, but with an intimation that the crown abandoned nothing of its claim for the debt. He then took a cottage at Putney.

Hook published his first series of 'Sayings and Doings' in Feb. 1825, in a spangling-house, and his diary records the profit to have been 300l. He reached his destination of 'Sayings and Doings,' First Series, 3 vols., 1824; Second Series, 3 vols., 1825; Third Series, 3 vols., 1828; 'Maxwell,' 3 vols., 1828; 'Life of Sir David Baird,' 2 vols. 8vo., 1822; 'Parson Darnel,' 3 vols., 1833; 'Love in a Village,' 3 vols., 1834; 'Gilbert Gurney,' 3 vols., 1835; 'Jack Bragg,' 3 vols., 1837; 'Births, Deaths, and Marriages,' 3 vols., 1839; 'Gurney Married,' 3 vols., 1839; 'Precepts and Practice,' 3 vols., 1840; 'Fathers and Sons,' 3 vols., 1840; 'Peregrine Bunce,' 3 vols., 1841, some months after his death. In 1830 he became editor of the 'New Monthly Magazine,' and 'Gilbert Gurney,' 'Gurney Married,' 'Precepts and Practice,' and 'Fathers and Sons,' were originally published in that periodical. He also wrote 'Kelly's Reminiscences,' from Kelly's notes, in 1856, without remuneration, and merely out of kindness to his old friend.

While residing at Putney he gradually mixed more and more from the literary world. In 1827, General Hall, who was at the Island Row, St. James's, which has since been the residence of a wealthy nobleman; he became a member of a young first-rate club, received invitations from persons of the highest distinction of the metropolis, and got into such a depth of debt, notwithstanding the large sums which he obtained by his literary labours. By his ambitious and criminal extravagance, which he supplied at a ruinous expense of labour of mind and body, his constitution, excellent as it was originally, was completely broken up. In July, 1841, when dining at Brompton, he was observed to be unwell, and as he stood with the coffee in his hand, turned suddenly to the mirror, and said, 'Ay, I see I look as I am; done up in purse, in mind, and in body too at last.'

From that time he was confined to his house. About the middle of August he requested the Rev. Mr. Gleig, chaplain of Chelsea Hospital, who was an old acquaintance, but had never been at his house, to pay him a visit. He did so, and being known to the servant as a clergyman, was admitted. The state of his house was somewhat confused at being caught in disshabille, but after a moment's pause, observed, 'Well, you see me as I am at last—all the bucklings, and paddings, and washings, and brushings, drop for ever—a dirty, grey-headed man, with my knees.' He had latterly been much made-up. He died Aug. 24, 1841, in the fifty-third year of his age. His novel of 'Gilbert Gurney' contains a sort of autobiography of himself.

While living at Somers Town he had become acquainted with a young woman, and by her he had six children; she was respectable, and he always behaved well to her, but he had not as near a relation to her, though according to his diary, he had sometimes thoughts of doing so. A few hundred pounds were subscribed for her and the children after Hook's death. He was a good-natured man, and willing to do acts of kindness, but he had no moral principles sufficiently strong to restrain the impulses of the moment.

Hook's conversational power was greater than his power as a writer. He was an admirable narrator, abounding in smart sayings, which, if recorded with skill and humour, were said as to appear the best things ever uttered, and could intermix serious remarks full of good sense and derived from a wide observation of life. His volumes are full of the most excellent descriptions of the various forms of life with which he had been conversant, rapid but striking sketches of character, and laughable extravagances, conveyed in a clear, unmeaning, and almost a peroration on some subject, for a popular writer, but is not likely to continue popular long. His novels will shortly share the fate of his dramatic pieces, and be forgotten. His satirical poems are little better than doggerel, and the points, now that the circumstances which gave rise to them have passed away, seem very blunt indeed; his power in these poems was generally in the coarseness of his invectives, not in satirical wit, of which indeed he had little, and that of inferior quality. There are many songs written by him which have never been published, and it is doubtful whether they are worth publication. (Quarterly Review, May, 1842, an entertaining and instructive article written in a fair and moderate style by Hook well; Gent.'s Mag., Oct., 1841, a bad article, written in a spirit of dull ennui.)

HOGLAN, A.D.C., deceased from the wealthy family of the 'Hoggs' of Amsterdam, and possessing with more than ordinary taste far more than ordinary means of cultivating and gratifying it, this gentleman established for himself a reputation of incomparable excellence, as the head of a mere amateur and collector, since he did much in behalf of art, both with his pencil and his pen.

Mr. Hope, who was born about the year 1770, gave very great precedence to the cultivation of his deportment, bearing to that branch of art which seems so much more than any other to depend upon acquired rather than natural and instinctive taste. 'From an infant,' as he himself tells us, 'architecture was always my
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favourite amusement. I was scarcely able to hold a pencil, when, instead of flowers, landscapes, and all those other familiar objects of which the imitation chiefly glories the facility of such children as show a turn for design, I already began dealing in those straight lines which seem so little adapted to the requirements of a more advanced age. No sooner did I become master of myself, which unfortunately happened at the early age of eighteen, than discarding the useful pursuits of my father's profession only in the consciousness of a closed, I hastened in quest of an interest for it in all the different countries where any could be expected. This valuable little scrap of autobiography amply illustrates the occupations and earnings I sacrificed to his encouragement of his youth and education. At the age of eighteen or nineteen, then, he went abroad, and remained there several years, occupied all the while very differently from most young men of fortune who visit other countries, for his passion for architecture induced him to explore regions that were then considered almost beyond the track of civilization—to study the monuments of Egypt on the banks of the Nile; those of Ionia, Northern Greece, the Peloponnesus, and Sicily; those of the Tartar and Persian styles in Turkey and Syria; of the Moorish and Arabic on the coasts of Africa and in Spain; those of the Etruscan, Lombardic styles, &c. in Italy; and finally, those in the south of France, Germany, Spain, Portugal, and afterwards here at home.

Eight years, he tells us, were thus occupied by him with a persevering application that would have brought the most profligate and drunken young rake to more serious pursuits. He had attended with many fatigue and privations, and frequently with great risks.

Soon after his return to England he began to apply his studies practically by remodelling and enlarging his mansion in Duchess Street, Portland Place, extending the plan of the original house very considerably by galleries carried around three sides of the court-yard. Of these rooms, which are in continuation of the apartments on the principal floor, the largest one (about 100 feet by 24) is on the north side, and the others, coexisting respectively of a suite of small cabinets filled with Etruscan vases, with little to table, and the statue gallery on the west. And in addition to these, Mr. Hope added several years afterwards (1820) the Flemish Gallery, so called from being entirely occupied by productions of that school. He thus rendered his house one of the largest private mansions in the metropolis; and though he did not bestow on it the slightest beauty of exterior or even any regard at all to appearance, he fitted up and furnished the interior in a style of refined classical taste that was then a decided novelty in this country. His first and memorable publication on Furniture, in 1805 (a splendid folio volume with sixty plates, exquisitely engraved in outline, and profusely lettered with the name of each designer and the furniture and decorations of his own mansion), created a revolution in taste. But it also drew down upon him the merciless ridicule of the Edinburgh Review, which could not resist the temptation to call him a medievalist, and one perfectly indifferently whether good or bad taste be shown in such matters, the reform in furniture of which Mr. Hope set the example, and further promoted by that publication, was assuredly a desirable one; and though there was a good deal of absurdity and caricature in the ultra-classical affectations of vulgar and parodying imitators, a very improved style of furniture—one marked by greater simplicity and intrinsic beauty—of which his taste has taken place and still prevails, where it has not been superseded by the tawdry frivolity of the Louis Quatorze and other fashions.

He created his Costumes of the Ancients, which had also great influence in promoting a taste for classical design and study; and in the same year he contributed to a periodical (by J. Landseer) entitled Review of Publications of Art, an essay on the Architecture of the Ancients. Mr. Hope had been the first to discern and patronize the talent of Thorwaldsen, whom he commissioned to execute his Jason for him in marble, now in the gallery in Duchess Street. But he was not always so fortunate as to select worthy objects of patronage, for in one instance he bestowed it where it was altogether unmerited. Some dispute arising between him and a French artist named Dubois, the latter painted and modelled a statue of Hope, which he was requested by Mr. and Mrs. Hope, and announced under the title of Beauty and the Beast. As may be supposed, the affair, which occurred in 1810, made a very great noise at the time, but the exhibition was soon brought to a close in a very summary manner by Mrs. Hope's brother, who mediated the picture by thrusting his stick through the canvas. Dubois brought his action for the injury, but did not succeed in obtaining damages.

With the exception of a minor work entitled Modern Costumes, in 1812, Mr. Hope did not publish anything further till 1819, when appeared his Anastasias, or Memoirs of a Modern Greek at the close of the Eighteenth Century, but as his name was not at that time known or even suspected to be the author, that it was at first impressively attributed by many to Lord Byron, as the only person capable of having produced it; and certainly Mr. Hope's previous pursuits and occupations gave me by no means of a kind to point him out as likely to be the author of so powerful a work of fiction. Of his two last works, both of them published posthumously, one of them was still more remote from what may be supposed to have been the constant tenour of his studies, for that On the Origin and Prospects of Man was almost the very last subject that would have been expected from his pen: from furniture to cosmogony the distance is immeasurable. Abstruse in its speculations, it was also considered unorthodox in some of its opinions, on which account it was afterwards withdrawn from publication, while his Historical Essay on Architecture, first published in 1825, has, on the contrary, been received by the public and by the townsmen of London as a work of far more than a series of hasty fragmentary notes. In fact it seems to have been left by the author in an unfinished state, and not even have been before published by him. In the northern district, the plates of statues, frescos, and sculptures of Lombardic and other styles scarcely ever before represented in English publications, contributed not a little to the popularity of the Essay, but the information they afford is of a very imperfect kind; as they consist of little more than outline drawings of the façades alone of the respective buildings, without even so much as a scale to enable us to judge of their dimensions, nor does the text supply any information as to the plates. They are, however, disfigured by typographical errors and other mistakes, the first edition was brought out with so little regard to convenience as a book of study and reference, that there was not even an index to it; wherefore Mr. E. Creasy published the following year, an Analytical Index, but it ought to have been accompanied by an alphabetical one also.

Besides the above works, Mr. Hope was author of several minor productions and pieces of criticism, one of them being a Letter to James Wyatt, relative to his designs for Downing College, Cambridge, upon which he animadverted very freely and apparently very justly. Another work—if it may be called—of his, which he left to his friend Mr. Vernet, was never finished, although he did not entirely build, he very greatly enlarged, and greatly embellished both the house and the grounds, which contain a handsome family mausoleum.

Mr. Hope died August 3rd, 1831.

HOPPER, JOHN, R. A., was born in London in 1759. There is a mystery, says Cunningham, about his birth, which no one has ventured to explain: all that is known with certainty is, that his mother was one of the German attendants at the Royal Palace.

When young he was one of the choristers in the Chapel Royal. He studied afterwards in A Rial Academy of Arts; and before he was thirty years of age he had, owing to the active patronage of Prince of Wales, painted more royal and noble portraits than usually falls to the lot of distinguished portraits. During the time when Hopper was still distanced by appearance and fashion, for and eighteen years Lawrence was his only rival: Lawrence was patronized by the king, while the prince and his party patronized Hopper: Hopper's style is easy and effective, but gaudy; his heads have frequently much character, and are well modelled, though perhaps the opposite case occurs more frequently, especially in his male heads: he had also great skill in landscape painting. He died of dropsy in 1810. His son was for some years British consul at Venice.

At the Exhibition of deceased British artists, at the British Institution in 1817, there were seven portraits by Hopper, representing all the principal masters of his time, which he presented to the Royal Academy in 1809, upon his election as a member of that body. His portrait of Nelson was in the exhibition at the same institution, in 1820, of Portraits representing distinguished persons in the
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ory and literature of the United Kingdom: it is, however, a less manly head than the one painted by Lemuel Abbott, which was engraved by J. Heath in 1801.

(Cunningham, Lives of British Painters, &c.: An Account of the Pictures exhibited in the Rooms of the British Institution, from 1813 to 1823.)

HORN. Mr. Arthur Aikin, in a paper on the manufacture of tortoiseshell, and whalebone, before the Society of Arts in 1832, and published in the fifty-second volume of their 'Transactions' (part ii., pp. 334-349), observes that 'in the English language we have only one word, 'horn,' to denote quite different objects, namely, branched bony horns of the stag genus, and the simple laminated horns of the ox genus, and other kindred genera.' Of the former kind, which are, with few exceptions, confined to the Cervidae, or antelopes, with species of Bos, and in which the species is given under Oks, P. C., p. 349. The uses to which they are applied are the same as those of bone and ivory, and the manufacture presents no point which requires notice. The other kind of horn, to which the French appropriately the same corne (while they apply the same boa to bony horns), is found in the ox, the antelope, and the goat and sheep kinds. Such horns, with the exception of those of the prongbuck [Antilocapre, P. C., p. 71], which are not referred to Aikin, are, he observes, 'never branched or palmed, but are always of a simile conical figure, more or less curved, and, in some of the antelopes, spirally twisted; they are found in both horns, and the growth of the goats and sheep much lasteth the male than the female. In all these animals, he adds, 'a bony core, of a loose texture and conical figure, rises from the bones of the forehead, covered by a permanent vascu- lar membrane, the tissue of which is so secreted thin layers of horn in constant succession.' It is sup- posed that one layer, or rather one set of layers, is produced every year; but, as the former layer remains closely adherent to the new one, such horns are not employed, lamellar in texture, and exfoliate only very slowly from the outside by exposure to weather and friction. The structure of such horns may therefore be described as a number of conical sheaths inserted into one another, the innermost, which lies upon the vascu- lar membrane which covers the bony core. The tip, or that portion of the point of the horn which projects beyond the core, is very dense, and the several layers of which it is composed are scarcely distinguishable; while towards the base the layers may be readily distinguished, owing to their successive terminations forming prominent rings. The horn proper is quite insensible, so that the tip may be cut off without giving pain to the animal; but if the core be cut into, bleeding ensues, and it becomes evident that pain is inflicted. Horn appears to consist of coagulated albumen; and Aikin translates the term lactica, used by the ancients for horns, into claws, hoofs, the scales of animals of the artiodactyl and to- toise kind, of lizards, serpents, and fishes, hair, feathers, and even skin. In the case of tortoiseshell and the armour, or ermine of the duck, and the sandal, the identity of the substance in appearance as well as in chemical character is sufficiently obvious; and the horns of the rhino- ceros appear to form a link with the hairy covering of lord mammalia generally. Next the bristles of the horse tribe, and the spines of the needlefish and porcupine. These horns are not formed upon a bony core, but are described as merely an aggregation of flattened hairs or bristles adhering by their sides, and presenting longitudinal pores or interstices of con- siderable magnitude at the base of the horn, and which become smaller towards the point, these interstices being, in the living animal, filled with a pulp matter. Whalebone, also, is described as consisting of two portions, the former illustrating the transition from horn to hair; but its uses in the arts differ much from those of horn. It is softened by boiling in water for some hours, and then cut into suitable lengths; the latter is usually prepared for purposes to which it is applied, by a longitudinal division being effected by splitting, or separating its fibres. It is usually of a dark colour, but that which appears jet black is dyed. It is much used in the manufacture of hats, and works of ivory in stiffening the edges of female dress, in whip-making, and in various other ways. While whalebone is also manufactured into very elegant bonnets, and occasionally into artificial flowers of great delicacy and beauty, and may be dyed by the painter. The principal kinds of horn employed in manufacturing operations are those of oxen, to which the hoofs of the same animals may be added. The horns of bulls and cows are pre- ferred; those of buckles being thin and of a coarse texture:

circumstance which seems to indicate some connection between the sexual functions and the development of the horns, similar to that mentioned under Deka, P. C., p. 350. Our dollar supply being unequal to this great demand, quantities of horn are imported from Russia, the Cape of Good Hope, and South America. The horns of goats and sheep, according to Dr. Ure (Dictionary of Arts, &c. art. Horn), are more white and whiter and more transparent than those of any other animals.

The first process in the manufacture of horn is to remove the bony core or pith, which is accomplished by steeping the horns in a solution of alkali, and peeling off the horn with fine chisels. Even after this process, the horn usually retains a thin account, or for about fifteen days in summer or a month in winter, according to Dr. Ure, by which operation the mem- brane which lies between the core and the horn sheath is so destroyed as to render the horn thin enough to be broken easily extracted. These, Aikin observes, are not thrown away, but are burnt to ashes, in which state they form the best material for the small tests or cupsella employed by sa- layers cold and silver. In some cases, according to Bal- tager (Economy of Machinery and Manufactures, ser. 270), instead of being thus used, the cores are boiled down in water, by which a quantity of fat is extracted, which, rising to the surface, is skimmed off and sold to the makers of yellow soap; while the liquid itself is used as a kind of glue, and is purchased by cloth-dressers for stiffening; and the remaining insoluble substance is crushed in a bone-mill for manufacturing the shellac, by which it is cut into small pieces and used as a frame-saw, and is employed for making knife-handles, umbrella-handles, the tops of whips, buttons, and various other articles. The remainder of the horn, which is employed for purposes of decraving, is thus laitered into small pieces, which may be left entire, or sawn into two or more lengths, according to the use to which it is to be applied. When divided, the lower part, or that next the root of the horn, is frequently employed for making the while the portion which has formed the middle of the horn is used for lanterns and similar purposes. To prepare the horn for use, it is immersed in boil- ing water for about half an hour, by which it is softened; and, when hot, it is easily worked, being cut with a file. It is then placed under a flame of a coal or wood fire, until it acquires about the tempera- ture of melting lead, and becomes so soft as to be semi- fluid. If the horn be from an old animal, care must be taken to expose the inside as well as the outside to the action of the flame. Mr. James, of Lambeth, a worker in horn, was re- warded by the Society of Arts in 1837 for a machine accomplishing this object much better than in the usual way. His apparatus, which is described in the forty-fifth volume of the Society's 'Transactions,' p. 164, consists simply of a block of cast iron pierced with a conical hole, and a conical cavity which opens off at the side of the block. The diameter of the hole is only a little larger than the diameter of the horn. These are heated in a stove or common fire to about the temperature of melting lead. The block is then taken out and placed on a firm support. A piece of the horn, which has to be worked, is fixed in the bay, and after the sides are slotted longitudinally, is then put into the hole, and the heated plug is dropped into the cavity of the horn. As the horn becomes softened by the heat, the plug is carefully driven in with a mallet; and by its pressure any original crookedness of the horn is removed. After remaining about a minute in this state the block is turned on one side, the plug is driven out, and the horn, which is sufficiently soft to be opened out flat, is removed. This apparatus is said to effect considerable saving of time, in addition to avoiding all risk of overheating the horn. In the more ordinary process, as described by Aikin, the heat is applied before the horn is slit; the slitting being performed while the horn is still whole, by means of a pointed knife resembling a pruning-knife; and, by the ap- plication of the pressure of a pair of pincers, one to each edge of the slit, the cylinder or cone of horn is opened until it is nearly flat. Several successive operations of the same kind are performed until, a lathe is turned, and the machine is heated and greased, to pre- vent the horn adhering to them, either in a press, or by placing them vertically in a strong iron trough, and compress- ing them, and, occasionally, the outer surface of the horn may be dyed by the painter.
twice, and for a blacker brown the dragon's blood may be added. This process, Aikin observes, is 'nearly the same as that employed for giving a brown or black colour to hair, and is called the painting process.' The prescription, which is an essential ingredient in alchemists' lead, dissolved in the alkaline, and thus introduced into the substance of the horn. Some other dyes are mentioned by Dr. Ure.

No part of the horn is more useful than the horn itself. But the oil which is the chief part of the horn is a valuable substance. When exposed to a decomposing heat in close vessels, horn produces a large quantity of the gaseous compound which forms the base of prussic acid, on which account hoofs and horns are in great request among the manufacturers of Prussian blue, and of the beautiful yellow prussiate of potash. The clippings of the comb-maker are also used as manure. 'In the first year after they are spread over the soil,' observes Babbage in the work above quoted, 'they have comparatively little effect, but during the next four or five their efficiency is considerable.' The shavings of the lamp-maker, from their extremely thin and divided form, produce their full effect more quickly.

Among the various uses to which horn has been applied, Aikin alludes to bowes, both ancient and modern, made either of wood or partly of this material, and to armour. He had seen a complete suit of arms which was said to have come from Arabia, made entirely of horn. The employment of this substance for glazing windows has long been superceded by the use of glass.

Hebert (Engineer's and Mechanic's Encyclopedia, vol. i. p. 683) alludes to a kind of artificial horn, the manufacture of which is said to have been established in France. It consists of powder obtained from bones, heated with muriatic acid, converted into a horny substance by tanning. Upon becoming hard and dry it resembles horn or tortoiseshell, both in appearance and in the facility with which it may be softened, by boiling in water with potash, and moulded to any required form. By inlaying with gold and silver, and staining with various colours, it may be rendered highly ornamental.

HORNER, FRANCIS, was born, Aug. 12, 1778, in the city of Edinburgh, where his father was a merchant. He was educated at the High School of Edinburgh; in 1792 he matriculated at the University of Edinburgh, where he pursued his studies till the summer of 1795. He was then seventeen years of age, and being disposed to select the law as his profession, his father sent him to England, and placed him under the care of the Rev. Dr. John Hewlett, of Shacklwell, in Middlesex, in order that he might get rid of his Scottish dialect, and gain some experience among strangers, as he had hitherto constantly lived at home. He returned to Edinburgh in Nov. 1797, and, having fixed upon the Scottish bar as his profession, at the age of twenty he laid down for himself a scheme of study which included almost every branch of science and literature. He studied Scotch law with his friend Henry Brougham, and in addition, with another friend, Lord Webb Seymour, he studied metaphysics and political economy.

In 1802 Horner began to have thoughts of exchanging the Scottish for the English bar, and in April of that year he came to London in order to work at the law, and fix his determination. His friendships and political opinions had associated him with the rising Whigs in Edinburgh; he was now received with acrimony by men of congregial opinions in London, as Mr. Abercorn, Sir James Mackintosh, Sir Samuel Romilly, and others. He resolved to attach himself to the English bar, and in the spring of 1803 he took up his permanent residence in London. It was an eventful and a stirring time. The war was again breaking out, the King's sanity was doubtful, and the Addington administration was giving way before the cross-firing of Pitt and Fox. Horner was not allowed to remain an unengaged spectator.

As his abilities became more known, his connections with the leading Whigs were extended. On the death of Mr. Pitt in 1806 the government was placed in the hands of Lord Grenville and Mr. Fox. Horner accepted a seat on the Board of Commissioners established by the East India Company for settling the Nabob of Arcot's debts, an unalarmed office, which however was to be remunerated at the close of the investigation. On the 15th of November, 1806, the Board announced that they had found itself an offer, through the intervention of Lord Kilmuir, of a ministerial seat in the House of Commons, which, after consultation with his friends, was accepted, and in Nov. 1806, he was returned for the borough of the old Whig party, which he had held together, immediately fell to pieces. A new parliament was summoned, and met on
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the 16th of December. This parliament was very short-lived. A change of ministry took place on the 27th of March, 1807.

Horner was re-elected on the 27th of April, and was immedi-
ately afterwards dissolved. Horner did not obtain a seat at the general election, but in the following July was elected for the

The chief peculiarities in the construction of the principal clocks of church towers and public buildings are generally known by the name of church or turret clocks.

Turret-clocks differ from other machines employed for measuring time, not only in their greatly superior size, but also in the arrangement of their parts, and in the circumstances that they are usually made to strike the hours, and often the quarters also, upon large bells, and are occasionally connected with machinery for chiming whole tunes at certain intervals upon a set of bells which, when mounted in a church-tower, are so hung, that by disconnecting the hammers of the chimes and striking apparatus, they may also be rung in the ordinary manner by means of ropes. A popular description of the manner of striking on St. Mary-le-Bone's church, as given in the 'Penny Magazine' for 1842 (No. 641), describing a visit to a church-clock factory and bell-foundry, which is illustrated by a representation of the clock of St. Anne's Church, Lime-

district was the same as through the interest of the Marquees of Buckingham. In the sessions of 1813 and 1814 he took a prominent part in the debates, and contributed one of the ablest speeches in the House of Lords in the cause of the Ensigns. Grey was a Whig in politics.

The Marquees of Buckingham declined to accept his resignation. On the 25th of June, 1816, he made his last speech in parliament, in favour of the Catholic claims, and against the intolerant and harsh treatment which Ireland had experienced from the government of this country. Symptoms of a pulmonary disease had already begun to show themselves in his constitution, and he was ad-
vised by his physicians to spend the winter in the south of England. Accompanied by his brother, Mr. Leonard Horner, he set out on his journey, and arrived at Pisa in the latter part of November. His disease grew rapidly worse, but he had no suspicion that it was dangerous, and he continued to lay down plans for future studies of an extensive and beneficent

city at Leghorn, where a marble table-tomb was erected to his memory by his father. At one of the ends of the monument is a likeness of him in relief, of the size of life, by Chantrey. A marble statue of him, also by Chantrey, is placed in the north transept of Westminster Abbey, the cost of which was defrayed by subscriptions among his personal and political friends. It is one of Chantrey's best works, and indeed one of the finest portrait-statues in the Abbey.

The character of Horner's understanding was that of vigorous reasoning in pursuit of important and often difficult truth. He had no wit, and made no pretence to any. His knowledge was extensive, and his judgment accurate, not only in the various branches of political economy, but in a great many other departments of literature. He was one of the projectors of the Edin-

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No. 117; and Watch, Reprint., P. C., p. 107, are further accounts of the different methods of ending time and striking upon bells. The principal object of this article is to supply information respecting some important modern improvements in the construction of the large clocks used in churches and public buildings in this country, and the names and buildings to which they are generally known by the name of church or turret clocks.

The name, which is often in large clocks, is made of wood, is about thirteen or fourteen feet long, its bob, or weight, being a mass of cast iron shaped like a double convex lens, about thirty pounds, and is supported by four heavy pulleys. Each of the four clock-faces is thirteen feet in diameter, and each pair of hands weighs about sixty pounds; but as the hands are very nicely balanced by weights attached to the
extremity opposite to the pointed end, the power required for moving them is much less than might be supposed. In some turret-clocks, indeed, the small size of the going-train and of the apparatus by which motion is communicated to the hands appears strangely disproportionate to the magnitude of the dial. In the Limeshouse clock, the head of the hammer by which the hours are struck weighs fifty-six pounds, and it is set in motion by the apparatus represented in Fig. 1, which may serve as an example of the striking mechanism of turret-clocks in general, although the details of course vary according to the relative situation of the clock and the barrel, which, in some cases, is the reverse of that here represented: the bell being above, instead of beneath the level of the clock itself.

Fig. 1.

In this cut a represents the pin-wheel, corresponding to the wheel f in the striking-train of the clock represented in Horology, P. C. 1, p. 300, Fig. 1, by the action of the projecting pins of which the end of the lever b, communicated through the levers c and e, the tail f of the hammer is depressed, and the hammer-head is consequently raised ready for a stroke. By the continued revolution of a, the end of the lever b, after being raised to a considerable height, is suddenly released, by which the hammer falls upon the rim of the bell, and the connecting apparatus resumes its original position ready for the next stroke. It must be borne in mind that the rod or wire d by which the levers c and e are connected, is here represented much too short, as in ordinary cases, it is of sufficient length to reach from one story of the tower to another.

Musical chimes, which form a pleasing though not very common addition to the mechanism of turret-clocks, require the addition of another train of mechanism, somewhat like to that which constitutes the striking-train, inasmuch as, like it, it is perfectly at rest for considerable periods of time, and is brought into action only at certain predetermined intervals by the action of the going-train of the clock upon a detent. The mechanism of the chimes very nearly resembles, on a large scale, that of a musical snuff-box; levers connected with hammers which strike upon a series of bells, being substituted for the springs which in the musical snuff-box are caused to vibrate by the projecting pins on the revolving barrel. Beautiful machinery has been introduced to facilitate the accurate pricking of the barrel, or insertion in their proper places of the pins which project from its surface; but the principle by which the series of hammers is regulated may be sufficiently explained by an account of the old method of performing it. A sheet of paper exactly equal in size to the surface of the barrel, and which, therefore, would completely cover it if wrapped round it and pinioned at the ends, in right angles with, the axis of the barrel, with as many parallel and equidistant lines as there are different notes in the tune to be performed, each of these lines indicating the position of one of the series of hammers projected by the hammer-head, and to whose right angles with the axis of the barrel, with as many parallel and equidistant lines as there were bars or equal divisions of time in the tune. These spaces were then subdivided by other lines, according to the number of minims, crotchets, or quavers in the bars of the required tune were marked by ink dots upon the paper on their respective lines and in the order of time in which they should be produced by the successive bars of the music and by the subdivisions of the bar. 'This done, the paper was placed upon the barrel, and the pins were inserted at the points indicated by the marks on the paper. This comparatively rude process, though inefficient for cases in which the sound is made, by shifting a little longitudinally upon its axis, to perform several tunes, indicates the principle common to the pricketed barrels of chimes, musical snuff-boxes, and barrel-organ.

Owing to the very limited demand for turret-clocks, and their great durability when well made and carefully preserved, the business of making them is confined to very few establishments, and has hardly been systematized into a manufacture, in the more definite sense of that term. Every clock being, in ordinary cases, made individually, and with comparatively little aid from machinery, turret-clocks have been very expensive, and in many cases inferior in accuracy and durability to many far simpler cheaper and more common machines, in the manufacture of which more extensive use is made of the lathe, slide-rest, planing-machine, and other contrivances for abridging labour and obtaining a higher degree of precision than could be secured by hand-labour. Mr. Dent, who had previously succeeded, in the face of much prejudice and opposition, in remedying a similar defect in the manufacture of chronometers, determined, when engaged by the Gresham Committee to make a turret-clock of unprecedented perfection for the new Royal Exchange, under the superintendence of Mr. Airy, the astronomer-royal, to meet this deficiency by establishing a clock-factory supplied with all the aids and appliances of modern ingenuity, in which the several parts of a turret-clock should be produced as far as possible in the same way as the component parts of a power-loom or other machine manufactured upon an extensive scale. By such a judicious outlay of capital it becomes easy, having once made the required models, to produce as many clocks as may be desired, the component parts of which, being perfected and which, while finished in a very superior manner, can be supplied at a cost greatly below that of what may be termed hand-made clocks. In the manufacture of smaller clocks and other horological machines, for which there is a more extensive demand, the application of manufacturing principles is even more important; and we may express a hope that the prejudices which have hitherto stood in the way of such improvements, and restrained the application of capital to this branch of ingenuity, are giving way. When the gentleman referred to above first introduced the use of the slide-rest in the manufacture of turret-clocks, his mode of proceeding, he concedes, in consequence of the jealousy of the clockmakers employed to use them, so continually out of order that he was compelled to call in the assistance of engineers to repair and work them; but now these clockmakers are brought together in the most cordial manner, and with the most satisfactory result.

One of the first points which would strike an observer in toe Exchange clock, and in other turret clocks made on the same principle, is the use of a simple but strong cast-iron framing, in which every strain is so completely self-contained that the operation of fixing the clock in its destined position is one requiring but little skill; whereas any of the ornamental required beyond the fixing of the frame on a firm and level base. Another, and a more unusual feature, which Mr. Dent has introduced into the turret-clock manufacture, although it is not adopted in the Exchange clock, is the use of cast iron wheels for the striking train, which is considerably larger than the going train. This peculiarity, which will be of great advantage, not only as a substitute of the mahogany durability of the metal, but also as tending greatly to reduce the cost of the clock, is not claimed as an invention by Mr. Dent, such wheels having been, according to information with which he has favoured the writer, used at the Registry Office in the past. In some old English clocks, we may state on the same authority, wheels of wrought iron were used, but the teeth of these had to be cut in the same manner as those of the ordinary conical wheel used in ships of war, while those of the cast-iron wheels are formed by the casting operation alone, from an accurate model. The wheels of the going train, which are not only smaller but require greater accuracy from the circumstance that any irregularity in their
action would impair the correctness of the clock, which is not
the case with the striking train, are best made of hammered
brass, which is a material more to be depended upon than gun-
metal. The wheels of both trains are formed with teeth of a
peculiar shape, on the subject of which Mr. Dent presented a
paper before the Royal Society in April 1664, in which
he states that the geometrical form of the wheel-teeth in
chronometers, watches, and clocks is seldom attended to by
the makers who either cut them from the wheel itself or
make the pinions with which they have been explained from the
circumstances of these operations being separated into two
distinct trades.

The system pursued by watchmakers to insure what they sup-
pose to be the geometrical form of the wheel-teeth is, he con-
siders, that it should, as nearly as possible, resemble the
shape of a bay leaf; while the terms geometrical circles or
pitch-lines are not understood.

Mr. Dent then proceeds to show that as the wheels of a clock move in one direction, an
opportunity is afforded of the teeth being so shaped that the
contact, or commencement of the force, may take place at
the line of centres, and, if possible, it should not take place before.

After cutting many experimental segments of wheels and
pinions, he adds, adopting various proportions in each case
beyond the geometrical circles, I came to the conclusion to
use for the wheel-teeth (the driver) the epicycloidal curve, and
for the wheel-teeth (the driven) the hypocycloidal curve, putting
nearly the whole of the curve on the wheel-teeth, in-
creasing the circumference beyond the geometrical circle,
by the addition of three teeth and spaces, allowing only 0.8 of the
pitch for the increase in circumference of the pinion, just to remove the possibility of any sharp edge.

In every case the epicycloidal curve has been described by roll-
ing the semi-diameter of the driven on the geometrical circle
of the pitch, whereas very nearly the proportions of the teeth
should be cut for the purpose of ascertaining the breadth that
the wheel-teeth should be in excess above those of the pi-
nion-leaves; for as the breadth of the wheel-teeth is in-
creased, and the leaves of the pinion narrowed, the effect of
driving before and after the line of centres is varied.

Mr. Dent has also applied this theory to the lifting of the
hammers, both of the striking apparatus and chimneys, by using
projections of an epicycloidal shape instead of the ordinary
round pins in the pin-wheel.

Among the other important features of the Royal Exchange
Clock, which are applicable to all others of similar character,
whether constructed with its peculiar contrivances for insuring
perfect accuracy or not, we may mention the use of hollow
iron drums instead of wooden cylinders for the driving barrels,
and the use of wire instead of hempen ropes for suspending
the weights. The first-mentioned of these improvements renders permanent accuracy of form more allowable, while
the latter obviates, in consequence of the much smaller size of the barrel, an undue elasticity for overloading, and is sufficient
length of rope may be coiled in a single layer upon the barrel
without increasing its length or diameter in an inconvenient
degree. The result is that the weight continually exerts the
same force, and the thickening of the barrel, while covering the barrel in two or three layers, its effective force is of necessity greater at the commencement of its descent, as it acts upon the circumference of the barrel plus the
thickness of the first or innermost layer of rope, than at the
latter part of its descent, when it acts on the circumference
developed on the barrel alone. Another important arrangement,
which, though formerly in use, had been departed from, and
is revived in this clock, is the driving of the hands of the
clock, and the raising of the hammer of the striking apparatus
directly from the axis of the driving-barrel, without the inter-
vention of the striking wheels and pinions.

In their determination to secure a public clock of unex-
spected accuracy, the Gresham Committee required that the
Exchange clock should have a compensation-pendulum, and
that it should be so constructed as not only to show perfectly
correct time upon the dials, but also to tell it with accuracy by
making the first stroke of the hour upon the bell true to a
second. This degree of precision is unattainable with the or-
dinary striking apparatus, as the effect of variations in the state
of the atmosphere upon the motion of the fly by which its
action is regulated, and of various circumstances affecting
the inertia of the machinery to be brought into motion, together
with the effects of expansion and contraction, the figure of the
vessel is not perfectly permanent and unchangeable, its changes are of a nature which is well understood, and may be calculated upon with accuracy. In such a case the clock is driven, and the time that the
lever by which the hammer is moved will become disengaged
from the pin or tooth of the pin-wheel by which it is
raised or depressed, render it impossible to adjust the mecha-
nism with certainty to produce such a result. In the Exchange
clock this difficulty is provided for by an arrangement for mov-
ing the lever and hammer to nearly the utmost degree required
before the time of striking, and causing the end of the lever,
which is formed in a peculiar manner for the purpose, to
remain poised delicately upon the rounded point of the projec-
ting edge of the pin-wheel when it is instantaneously released, and thus the stroke is pro-
duced without being affected by the preliminary operation of raising the hammer.

The principles upon which pendulums are provided with
compensations for changes of temperature are explained under Pendulum, P. C., pp. 402, 403. That of the Exchange
clock is an ordinary isochronous pendulum, well adapted for large clocks.

The centre rod of the pendulum is of steel, and is sufficiently long to pass completely
through the bob or weight, which, however, is not immedi-
ately attached to it. Upon the bottom of this rod is fixed a
nut, by turning which the length of the pendulum may be
nicely adjusted, and upon which stands a hollow or tubular
column of zinc, through which the steel rod passes freely.

On the top of the zinc column is a metal cap, from projecting
portions of which descend two slender steel rods, to the
lower ends of which the weight, which is a hollow cylinder of
iron, capable of sliding freely upon the zinc column, is sus-
pended. The relative position of these two smaller steel rods by which the weight is suspended, expand downwards upon any increase of heat, the position of the
weight in reference to the point of suspension of the pen-
dulum, and thereby determines the length of the pendulum,
though shorter than the central steel rod, expands, owing to
the different nature of the metal, to an equal extent upwards,
and consequently raises the weight just as much as it is de-
necessitated to maintain the proper length of the pendulum
for the position at which we are describing weights nearly four cwt.,
the operation of setting it to the required nicety, that its
beats might be correct to within a fraction of a second, was
a matter of extreme difficulty. This was met by a contrivance
suggested by Mr. Airy: the clock being started at a very
small losing rate, a slender spring so mounted as to touch the
pendulum, to prevent any small errors in the time of going, such being provided for by the use of small supplementary weights on the outer side of the top of the pendulum-wheel, which weights may be applied or removed without stopping the clock.

While on the subject of compensation, pendulums we may
observe that Sir John Robison, in his paper on the meas-
uration in 1838, in which, among other matters, he explains an
improvement which he had introduced in the construction of the mercurial pendulum, which is that generally adopted for
the very slow going clocks called marine clocks. In this
mercurial Clock. The ordinary construction of this admirable
pendulum, which is described and illustrated under Pendulum,
P. C., has the mercury in a glass jar, the fragility of which not only exposes it to the risk of fracture, but also renders
it unsafe to boil the mercury after filling it, to drive off the air
which it always contains. Further than this, while it is pos-
sible to give, externally, a mathematically correct form to
a glass jar, it cannot be made to be a perfect figure, and
consequently the column of mercury which it contains cannot be a perfectly regular cylinder. 'This condition,' Mr. Dent
observed, 'is the more advantageous with the iron jar, which
glass is peculiarly liable to from its compound nature, renders
measurement and calculation, with regard to the column, so
vague and deceptive that they are never employed.'

These defects he has removed by substituting a jar or cistern of
extraordinary form, and although these are affected by the effects of expansion and contraction, the figure of the vessel is not perfectly permanent and unchangeable, its changes are
of a nature which is well understood, and may be calculated upon with accuracy. In such a case the clock is driven, and the time
at which the lever by which the hammer is moved will become
disengaged from the pin or tooth of the pin-wheel by which it is
raised or depressed, render it impossible to adjust the mecha-
nism with certainty to produce such a result.
it may be instantly attached to the wheel-work by any workman capable of setting the clock upon its escutcheon; and if at any subsequent period, minute portions of air have, from any cause, again mingled with the mercury, and rendered the pendulum susceptible of barometric changes, the air may again be driven out by the greatest facility, as by the process of boiling, without removing the mercury from the cistern.

In connection with this improvement Mr. Dent has introduced some other alterations in the construction of the mercurial pendulum, among which is the attachment of the cistern directly to the pendulum-rod, and consequent removal of the metal stirrup or frame formerly used to carry it, and the prolongation of the rod so as to plunge its lower end into the mercury, near to the bottom of the cistern, an arrangement favourable to uniformity of temperature in the rod and mercury; and since the date of the paper we have quoted, he has, with a view to obtaining additional precision in the performance of the astronomical clock, taken out a patent for giving impulse to the pendulum at, as nearly as can be determined, the centre of percussion. In this arrangement, the pendulum, instead of being suspended below the clock, is suspended from a fixed point at the top of the clock-case, while the clock itself is at the bottom, the only connection between the two being effected by momentary contact, at the extremities of the range of the pendulum's vibration, with two slender pieces attached to the escapement. In the old arrangement, the inventor observes in his published *Abstract from Two Lectures on the Construction and Management of Chronometers, Watches, and Clocks*, delivered before the members of the United Service Institution, May, 1841,* the pendulum never vibrates independently of the mechanism of the clock; besides which, the impulse is given under very disadvantageous circumstances, as the greater part of the force communicated by the escapement is lost at the point of suspension.

In his patent astronomical clock, with the detached pendulum, these defects are in a great measure remedied, for he states that if the pendulum vibrates to degrees from the perpendicular, one degree and forty-five minutes will be entirely detached from the mechanism, and the irregularities occasioned by friction and other disturbing causes are avoided.

Returning to the turret-clock at the Royal Exchange, in which the connection of the pendulum with the wheel-work is of the more complete nature, the escapement is the next point which claims notice, though it is too complicated to be fully described without several figures. Its chief peculiarity is that it is of the remontoire kind, a circumstance in which it resembles some of the best public clocks in France; among others, that of the Bourre at Paris. To explain this it may be sufficient to state that the impulses imparted to the pendulum are not given immediately from the large going-wheel of the clock, but are transmitted from varying friction, from changes in the state of the oil used to lubricate the mechanism (the use of which, however, is limited to the least possible degree), and from the effect of the waves on the surface of the water, which in this case are nine feet in diameter; but these impulses are given by a small secondary train, set in motion by the descent of a ball or weight, which itself raised at intervals of twenty seconds by the mechanism of the going-wheel. The action is therefore very similar to that of a remontoire-spring, which, as used in some horological machines, is a small spring employed only to set the escapement in motion, it being itself wound up at very short intervals by the going-wheel, which receives its impulse from the prime mover. Such a contrivance favours accuracy of performance by detaching the escapement, by which the velocity of the machine is determined, or from the effect of the movement of time is affected, from the power, necessarily subject to some irregularities, by which the greater part of the machinery is kept in motion, whether that power be supplied by a weight or a spring. The effect of this is to prevent the dead-beat escapement, and has the pallet jewelled with large sapphires; but in his ordinary turret-clocks Mr. Dent uses a modification of Lepaute's escapement, over a single pin. In this clock, the same has been provided a satisfactory arrange-ment for maintaining the motion of the wheels during the time of winding up, which was invented a few years since by Mr. A. A. for the clock-work of the Mt. Northumberland telescope at the university of Cambridge, and of which he published a description in the *Transactions of the Cambridge Philosophical Society*, vol. vii. part ii. p. 217. Harrison's beautiful contrivance of the going-fusee, of which a description is given under Horology, P. C. p. 501, is not sufficiently powerful for application to large clocks, in which the strain of very heavy weights has to be provided for; but Mr. Airy's contrivance, which he describes as 'a new construction of the going-fusee,' supplies the deficiency. Its action will be understood from the annexed diagram, Fig. 5, which represents one of several forms of the apparatus shown in the illustrations of Mr. Airy's paper. In this diagram a represents the first wheel of the clock, which is mounted, as usual, upon the axis of the rope-barrel b, with a ratchet and click so arranged that the two must turn together whenever the rope-barrel is turned, by the action of the weight W, through the line l, in the direction indicated by the arrow; while, when the rope-barrel is turned in the opposite direction, to wind up the weight, by the action of a windlass on the axis of the wheel d, which engages the toothed wheel e on the axis of the barrel, the wheel a will not turn back with the barrel. f is the pinion which is turned immediately by connection with the first wheel a; and both this and the winding-wheel, or pinion, d, have their axes mounted in the plates of the clock-frame. The axis of the barrel and first wheel a, instead of being thus mounted, is attached to what may be termed a lever-frame, one side of which is seen in the cut at g, h, i, which is itself pivoted to the clock-plates at a, and to the end l of which the end of the line a, l, is attached, after passing under a running pulley attached to the weight W. e is an internal ratchet on the first wheel a, acted upon by the long click m, which has its opposite end attached to the lever-frame near its extremity. While the clock is going in the ordinary way the descent of W causes that part of the line marked l to turn the barrel in the direction of the arrow, carrying with it the first wheel a, the internal ratchet of which slips under, without being affected by, the click m. Under these circumstances the resistance of the weight W (through the line l), and the resistance of the pinion f, produce a certain pressure on the lever-frame at p, which causes the end i to assume a determinate position, in which it remains without motion so long as the weight continues to descend, and consequently to draw down the line l; but so soon as, by the operation of winding up the clock, the pressure upon f ceases to operate, the stress of the weight upon the portion of the line marked l causes the end i of the lever-frame to be depressed, and the click m, which is connected with it, to be thrust against the internal ratchet e, sufficient force to maintain the action of the first wheel a, which turns as it were in one piece with the lever-frame round the axis a, thereby producing a pressure upon the pinion f exactly corresponding, if the axis h corresponds with the point at which the strain of the line l is applied to the rope-barrel b, to the pressure which is exerted during the ordinary action of the machine.

The machinery connected with the Exchange clock for chiming upon a set of large bells in the turret was constructed by the same gentleman as the mechanism of the clock itself; but, owing to difficulties in the tuning of the bells, it is not yet (Nov. 1845) brought into action. These chimes will be the first constructed in this country to play tunes in
harmony, two or more notes being struck simultaneously upon different bells, whereas in most cases the melody is produced in single notes, without the introduction of chords, which not only requires the machinery to be more complex, but renders it necessary to adjust the bells into more perfect tunes than is necessary for ordinary chimes.

HORSE-RADISH. [Cochlearia Amoracia, P. C. S.]

HORSE-SHOE. [Horses, P. C. S.]

HOSPITALS. [Temples, P. C. S.]

HOTTONIA, a genus of plants belonging to the natural order Primulaceae. It has a 5-parted calyx, divided almost to the base, with the bilum, close to one end; the stamens, 5, inserted and included in the tube of the corolla; the capsules many-seeded and 5-valved, with 10 teeth. H. pauciis is the flowers whorled, stalked, and seated upon a long solitary cylindrical cuneo peduncle, the corolla longer than the calyx, the leaves pinnatid. It is a native of Great Britain in ponds and ditches, and is called the Water-Violet. The leaves are submersed and crowded; the flowers rising above the water are of a purple and yellow color. It is a pretty plant, but possesses no useful available properties. (Babington, Manual of British Botany.)

HOUBRACKEN, the name of two distinguished Dutch artists, father and son.

Arnold Houbraken, the father, was born of a good family at Dort, in 1660, and was the pupil of Samuel van Hoogstraten. He painted history and portrait, and executed many miniatures. He died suddenly at Amsterdam; and he visited this country and remained here eight or nine months, for the purpose of making drawings of some portraits by Vandyck, which were engraved by Van Gunst. Houbraken (1740) is the biographer of his father, for his account of the lives of Dutch painters, with portraits engraved by his son, in continuation of Van Mander—'Grootsch Schouburg der Nederlandse Kunstenschaffen en Skilderessen,' in three parts. The text and second parts were published at Amsterdam in 1718 and 1719, for the author; the third part was published in 1721 for his widow: Houbraken died in 1719.

Jacob Houbraken was an admirable engraver; in execution he has been somewhat surpassed; yet he is certainly one of the finest etchings in existence. The most beautiful specimens, however, of Houbraken's engravings are some of "The Heads of Illustrious Persons of Great Britain," published in London by the Knaptons in 1748; the excellence of some of these heads must be seen to be comprehended. Vertue was a good engraver, and executed a few of the heads in this collection; but his inferiority to Houbraken was so apparent that the addition of those heads, which are more in number than any other in this series, were not accepted. Some of the heads, however, which were engraved by Houbraken, though of the highest excellence as works of art, were not regarded as portraits; as, for instance, those of the Earl of Somers and Secretary Thurloe, which Wallis says are spurious. [Vertue, George, P. C. S.] The collection is notwithstanding of great historical interest. Houbraken engraved also a great number of portraits of distinguished Dutch characters. He died in 1780.

(Van Goell, Nieuwe Schouburg der Nederlandse Kunstschaffen, etc.; Waterlo, Dictionnaire des Arts, etc.; Huber, Manuel des Amateurs, etc.)

HOUSE. [Houses, P. C. S.] A general outline of the principal features in the construction of houses being given under Building, P. C. S., and in the various articles in P. C. S. and F. C. S. which are referred to under that head, the sole object of this article is to supply one of the articles of the series there pointed out, which, in consequence of an accident, was unavoidably omitted under its proper title, Floor.

In the name floor, the same restrictions applied, collectively, to all the apartments and passages in a house upon one and the same level, in which sense it is almost synonymous with story. In a more literal sense however the term is confined to what is called the lower horizontal side of such apartments, and the under surface of which either constitutes or supports the upper horizontal side, or ceiling, of the apartments of the story immediately beneath it. With respect to the horizontal support of the floor, the internal or partition walls should be made to bear their share of the weight and strain; and where, as in the case of shops, warehouses, and public build-
for the struts. In some cases solid pieces of wood cut to fit the intervals between the joists are used instead of diagonal, or, as it is sometimes called, herring-bone strutting; and, whatever be the form of strutting employed, it is usual in cases where the floor will have to bear great weight to make the struts approximate very slightly to the wedge-shaped form of the voussoirs of an arch, in which case the floor may, by the addition of iron ties passing through the joints, rather below the middle of their depth, be force up into a convex form, whereby its strength will be enormously increased. When a timber floor is carried near to a chimney or fire-place, a method of strutting employed, it is usual in cases where the brickwork, to prevent the risk of fire. In such a situation the carpenter has recourse to what is termed trimming, which may be understood from the subjoined ground-plan of part of a floor of joists, abutting against a wall in which is a fireplace with chimney-flues in the jambs. In this cut a, b are two of the ordinary joists, the ends of which are supported in the usual way upon wall-plates; b, c are two joists made somewhat thicker than the rest, on account of the extra strain thrown upon them, and called trimming-joists; c is a piece of timber called a trimmer or trimming-joint, the ends of which are formed into tusk-tenons, which pass completely through the trimming-joists, and are secured by keying or wedging in such a way as to prevent them from separating; and d, e, are the trimmed joists, or those which, being cut off short of the wall, have their ends supported by being framed into the trimmer. The stone slab in front of the fire-place is supported between the ight and trimming-joists by a flat brick arch, sometimes called a brick trimmer, turned between the wall on the side, and a piece of wood called a springing-piece, which answers the purpose of what engineers term a skew-back, attached to the trimmer, on the other side. When the direction of the joints is parallel to that of the wall in which the chimney is formed, the arrangement is of course somewhat different; one strong trimming-joint then takes the place of the trimmer c, and two short trimmers are put in the place of b, c.

The chief objections to the use of single flooring are, that the construction offers little obstruction to the transmission of sound from one story to another, and, for the sake of the ceiling, the joists must be made thin. Both of these defects may be in some measure overcome by the arrangement shown in Fig. 2, in which every third or fourth joist is made an inch or a half deeper than the rest, and a series of slight bars called ceiling-joists, of which is shown in the cut at d, is nailed, or notched and nailed, to these deeper joists, so as not to touch the intermediate joists, and to these the ceiling laths are nailed. By this arrangement the joists may be made of any required thickness, and the ceiling is in a great degree relieved from the injurious vibration of the floor: and the effect of the shrinkage of the joists, which would cause the ceiling to crack.

In a double, or more properly a double-framed floor, three sets or tiers of joists are used, of which the middle set, called binding-joists, or simply binders, form the real support. These reach from wall to wall, or from one primary point of support to another, at intervals which may vary according to circumstances, but are usually about six feet; and they are mounted, at right angles with their own direction, by a series of smaller joists, called bridging-joists, which may, if it be important to save depth, be notched on to them, and upon which the flooring-boards are laid. Beneath the binding-joists is a set of yet smaller ceiling-joists, similar to those in the construction illustrated by Fig. 2. If it be necessary to save depth in fixing these also, care must be taken not only to fit them to the thickness of the boards, but to fix them in such a way that the floor will have to bear great weight to make the struts approximate very slightly to the wedge-shaped form of the voussoirs of an arch, in which case the floor may, by the addition of iron ties passing through the joints, rather below the middle of their depth, be force up into a convex form, whereby its strength will be enormously increased.

![Fig. 1](image1)

![Fig. 2](image2)
easily remedied by the simple plan of laying a horizontal pole along the foot of the rack to support the lower ends of the floor. A new floor is a very essential both to appearance and comfort that the shrinkage of the boards after they are laid should be reduced to the lowest possible amount. On this account, also, narrow boards are preferable, for seven or eight不得 being extensively used. Sometimes much narrower pieces, formed by cutting planks into two or more widths, are employed, especially in superior houses, where a second planking of which the blank is laid over the principal floor over a kind of veneering or finish. An inch may be considered the least thickness which can be proper for flooring-boards, although, as shown under Batters, P. C., p. 45, inferior rooms are frequently laid with boards of which some are cut from a batten originally under three inches thick. Ingenious machinery has been contrived and extensively used for the sawing and planing of flooring-boards; but such machines are frequently objected to as causing a considerable waste of timber, by cutting away much more, in width as well as in thickness, than it is needful to do in dressing them by hand. Hebert (Engineer's and Mechanic's Encyclopedia, art. "Flooring") describes the machine invented by Mr. Muir, of Glasgow, and which has been brought into use in several extensive establishments, by which, while the simple planing of the surface may be perfectly performed, the edge is cut in a bevel at the same time, and, if required, to cut grooves in them for the purpose of tonguing the joints.

The operation of laying floors is by the operation termed folding, the floors thus laid being termed folded floors. In this operation one board is first laid down and secured firmly by nailing to the joists. Another is then laid down and fastened in like manner precisely parallel with it, but at such a distance from it as barely to leave room for two, three, four, or any other determinate number of intervening boards. When, therefore, these intervening boards are laid in the place provided for them, being rather too wide for the space, they buckle up in the form of an arch. Boards are then laid across them, and upon these boards two or three men jump until the flooring-boards are forced down flat to the joists, to which they are securely nailed. Another portion of the floor is then laid in the same manner.

The edges of the boards in a folded floor must of necessity be plain or square, and the boards must be nailed to the joists near both edges, in consequence of which it frequently happens that in shrinking they split or crack along the middle. In superior floors joints formed by ploughing and tonguing, or by rebating and lapping the adjoining edges, are often used. Reaping, or cutting off by nailing, is the only thing that prevents allowing for the movement consequent upon shrinkage, without impairing the air-tight character of the floor, which is not only important for comfort, but also as a check to the progress of decay. The floor is therefore dovetailed at one side only, the nails being driven in obliquely through the edge, so as not to show at all on the surface. Some workmen insert the dovetails over the joints only, and others only over the interjoints, but perhaps the best way is to put them sufficiently close to have one over every joint, and one over every interval or interjoint. The gauge for the dovetails should be run from the under surface of the board, which should be straightened for the purpose. Flooring-boards, when worked by hand, are generally left rough on the under surface, excepting for a short distance from each edge, the intervening portion being merely smoothed with an adze at the points where the board crosses the joists. The floor is then finished by driving in nails driven at a lesser distance. The object of forcing the boards of a floor laid otherwise than by folding up to one another as close as possible, some carpenters employ an ingenious and very efficient machine, named a flooring-cramp, invented by H. F. S. In this apparatus, the floor is divided into panels, and the whole is nailed down flat to the joists, as described in Hebert's work above referred to. It consists of a lever of what is termed the second class, in which the fulcrum is at the lower end and iron box made to slide and slide upon one of the joists, upon which it may be fixed at any desired point by driving a wedge. Being brought close to the edge of a fresh-laid board, the workman seizes a handle at the end of the beam, which, operating it towards the face of a pair of iron with great energy against the edge of the board, and makes the joint exceedingly close. In using either this cramp, or the cheaper substitute for it called a dog, it is well to lay a loose fillet between the cramp and the edge of the board, to preserve it from injury by the forms exerted. Any floor thus laid a plank at a time is said to be straight-jointed, as distinguished from a doubled floor.

The heading-joints, or those between the ends of the flooring-boards, are usually tongued, that is, fitted by making very close and tongued. In dwelled floors the heading-joints must be broken, or so arranged as not to come opposite to one another, and the same precaution is advisable in other floors also, though unnecessary. For this purpose, iron nails are driven in the rafters, or the ceiling joists, or in the sides of the chimney, to which the timbers are so united by means of iron, brick, and masonry, that occasioning any unpleasant draught in the rooms. It is always highly important, for the preservation of the timber, to do this in the case of floors laid in a basement story, which rest upon what are termed ground-joints laid upon brick or stone piers or dwarf walls; and in many of the best London houses it is also done for upper floors, the air-bricks being sometimes concealed by architraves or cornices, or other representations of such a machine, invented by Mr. Muir, of Glasgow, and which has been brought into use in several extensive establishments, by which, while the simple planing of the surface may be perfectly performed, the edge is cut in a bevel at the same time, and, if required, to cut grooves in them for the purpose of tonguing the joints.

Flooring is measured by the square of 100 square feet. Respecting the construction of floors with special reference to safety from fire something is said under Fire-Proof Buildings, p. 146. The plan of a floor is said to be air-tight, which it can only be by virtue of excellent workmanship and some peculiarity of construction, is a very important preservative against the spread of fire, and is also useful for enabling the builder to introduce a current of air among the timbers by means of iron air-bricks, without occasioning any unpleasant draught in the rooms. It is always highly important, for the preservation of the timber, to do this in the case of floors laid in a basement story, which rest upon what are termed ground-joints laid upon brick or stone piers or dwarf walls; and in many of the best London houses it is also done for upper floors, the air-bricks being sometimes concealed by architraves or cornices, or other representations of such a machine, invented by Mr. Muir, of Glasgow, and which has been brought into use in several extensive establishments, by which, while the simple planing of the surface may be perfectly performed, the edge is cut in a bevel at the same time, and, if required, to cut grooves in them for the purpose of tonguing the joints.

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in out-buildings, floors or pavements of bricks and tiles are used. But bricks and tiles may be laid either in dry sand, in mortar, or in cement. The better kinds of brick pavement are laid with a peculiar kind of hard brick made for the purpose, and sometimes used also in masonry. In some cases, the stones are provided in boxes or papers. Flat brick pavement is very fragile, and is damp from the earth upon which it is laid; but brick-on-edge pavement is in some cases superior to stone, supposing the stone to be laid immediately upon the ground. When used for beer-cellar, pantries, dairies, or stables, brick-on-edge pavement laid in dry sand is convenient from the facility which it affords for the escape of fluids splinter upon it. Some paving bricks are concave in the center, and bear on the lower side flats, and this number, one inches to one and one half inches and a half one. A small hand clinked, called Dutch cenguins, is used almost exclusively for brick-on-edge herringbone pavements, in which the bricks of each course had now made him an angle of 45° to the direction of the course; and each course is inclined in the opposite direction to the adjoining one. Square paving tiles, laid in courses like stone pavements, make a very neat-looking but not very durable pavement. Brick-tile pavements admit of considerable variety and ornament in the colours and disposition of the component parts, especially in combination with the stone or tile flooring devices in several colours. [TILES AND PAVEMENTS, P. C. S.]

Floors of cement are occasionally used in fire-proof buildings, in which cases Mr. Richardens and Mr. Smellie have constructed and covered with the cement to form a level surface to receive the cement. This is occasionally done in private houses in preference to surround the vaulting with a wooden floor. In some places floors, even of considerable height, are not covered, but spread upon the ground. Floors of cement are very cheap, and in some degree fire-proof, but their surface is very apt to wear into holes. Floors of tempered earth, or of various compositional substances, are sometimes used for purposes of this kind. The floors in each other and bound together by mixing with cement, are also occasionally used in cottages and rural buildings, and may be made very hard. Floors of pavements of ashphalt are noticed under ASPHALT, P. C. S., p. 145. [Nicholson, Architectural Dictionary, arts. 'Floor,' 'Car- racee Flooring,' and 'Naked Flooring'; Encyclopaedia Britanniaca, art. 'Building in England'; Burckhardt's Egypt and Nubia, &c. &c. &c.]

HOUSE-BREAKING. [LAW, CRIMINAL, P. C. S.]

HOUSE-LEEK. [SEMISVYVUM, P. C. S.]

HOWELL, JAMES, the son of a clergyman in Wales, was born near Brecon, about the year 1696. He was educated at Jesus College, Oxford, where, in 1710, he took his bachelor's degree, but left the university. His father's family was numerous, and he had to shift for himself. Several men had, having set up a patent glass-manufactory in London, Howell was appointed to be their steward or manager; and in 1719 he undertook for his employers a tour on the continent, in the course of which he visited Holland, Flanders, France, Switzerland, and Germany, where, after he was elected a fellow of Jesus College. He next travelled as tutor to a young gentleman; after which he was sent to Madrid to negociate the purchase of a confiscated merchant. His skill and activity in business were remarked, and he was appointed by that nobleman's liege. In 1740 he entered Denmark as secretary to an extraordinary embassy; and on his return he continued to be for some time unemployed, visiting France and Italy, and was appointed by that nobleman's liege. In 1740 his diversified services were rewarded by an appointment to the clerkship of the council at Wittenberg; but the breaking out of the civil war soon made his place dangerous, and in no long time deprived him of it. In 1643 he was committed to the Fleet, where he was detained till after the king's death. He was pursuivant, and even in debt; but, with his characteristic veracity and spirit, he set about writing for the press, by which he contrived to maintain himself, both during his imprisonment and afterwards under the Protectorate. A little Flattery which he was at the same time convenient to administer to Cromwell, was forgiven at the Reformation, when the praise of historiographer royal was created as a means of providing for him. He retained this office till his death, which happened in November 1666. He was buried in the church of St. James. Howell's writings are very numerous. A few of them are in verse, the principal being his 'Doceana Groce,' or the Vocal Obscurites,' 1640. But his prose works alone deserve remembrance; and of these there are not a few which either were pamphlets of temporary interest or translations of historical pieces from the French and Italian, in the parts of which his name is preserved by the good sense, sagacity, and liveliness of his letters, which were the earliest collection of the kind published in our country. They were chiefly called 'Epistolas H.R.C.' familiar letters, domestic and foreign; partly historical, partly political, and partly philosophical.' The first volume appeared in 1645, the fourth and last in 1655, and they have since gone through many editions. [HUGHES, John, Bp. of Exeter, who was called the Dutch battle-painter, was born at Haarlem in 1646. He studied with Vandermeulen at Paris, and etched some of his designs. In 1708 or 1709 he was commissioned by Prince Eugene to paint the series of battles which he and the Duke of Marlborough had joined together. Huchtenburg himself made etchings of these battles in copper: they were published at the Hague in 1725. His pictures are much in the style of Wouwerman, and are scarcely inferior to the works of that master. He lived chiefly at the Hague, but died at Amsterdam in 1733. (Van Gool, Nieuw Schouburg, &c.)

HUDSON, THOMAS, was born in Devonshire in 1701. He came to London and became the pupil of Richardson the painter, and married his daughter. After the death of Jervas he joined with Reynolds as his assistant, and as a portrait painter in London, and, notwithstanding the rivalry of Vanloo and Liotard, he enjoyed the chief business in portrait painting until the return of his pupil Reynolds from Italy, and the group of three young men, who came to London in 1763, in innovation in portraiture, he gave up business and retired to his villa at Twickenham. Northcote describes an interview between Hudson and Reynolds in 1764, soon after the return of the latter from Italy, in which Choizet was present. Hudson called Reynolds to see a much-talked-of head of a boy with a Turkish head-dress—it was the portrait of the Italian boy Marchi, whom Reynolds had brought with him from Italy; 'perceiving,' says Northcote, 'no trace of his own manner left,' Hudson exclaimed, 'By God, Reynolds, you don't paint so well as when you left England!' Hudson himself had also just returned from Italy, and he visited him together with Roubilais. He entered Italy as Reynolds was leaving it, and the rising and setting stars of portraiture in England met on Mount Cenis in their passage over the Alps. There is little to be said of Hudson's style: he was of the Kneller school; he made fair transcriptions of his models, with little variety of posture, and not much more of costume. His master-piece is a portrait of Charles Duke of Marlborough, now, in the hall at Blenheim: many of his works were engraved in mezzotint by the younger John Faber. There is a portrait of Handel by Hudson in the Picture Gallery at St. James's Palace. Hudson was a most skilful and diligent composer ever sat for: there is a portrait by him of Archbishop Potter in the same collection. Hudson was rich and contented. He had at his villa at Twickenham a very extensive collection of cabinet pictures and drawings by great masters; many of the latter were purchased at the sale of Richardoun's excellent collection. He survived Richardson's daughter, and married Mrs. Fenners, a lady of fortune, and to her he bequested his villa. He died in January, 1779. (Walpole, Anecdotes of Painting, &c.; Northcote, Life of Sir Joshua Reynolds.)

HUGHES, JOHN, the son of a respectable citizen of London, was born in 1677, at the town of Marlborough, in Wiltshire. He was educated in London, chiefly at a dissenting academy, where Isaac Watts was one of his fellow-pupils. His natural turn for study was encouraged by the delicacy of his health, which made his friends well pleased to obtain for him a small income in the public service. He held a clerkship in the Ordnance-office, and was secretary to several commissions issued under the great seal for improving harbours. In 1717, too late to permit him to enjoy affluence long, he was appointed by Earl Cowper to be clerk to the commissions of inquiry into the state of the peace. He had, in 1707, been Cromwell's private secretary, when the peace of Ryswick was arranged, and in 1697, celebrated the peace of Ryswick, introduced him to the acquaintance of Addison, Pope, and other literary men, whose liking he was well qualified to secure by his good temper and want of pretensions. When Addison's critical friends, on reading the first four acts of
Cato,' had condemned it. Hughes dissected, and insisted on its being completed; and although the author afterwards completed it himself, yet Hughes was in the first instance intrusted with that task. Hughes wrote a tragedy called 'The Siege of Tenochtitlán,' and it is in several modern editions, and merits its place for the excellence it possesses in language and in lofty and refined feeling. It was acted for the first time on the 17th of February, 1760, and received such applause that night, that Mr. Hughes died of the heat he excited in his house. Hughes died on the 22nd of May, and was buried the next day. His contemporaries, and even his enemies, lament his loss. He was a man of great learning, and his name is associated with that of his master, Dr. Johnson. Hughes left behind him many works, of which the 'Tales of a Traveller' and 'A Delightful Conversation' are the best known. He was also the author of a book on chemistry, which was published posthumously.

HUMBOLDT, KARL WILHELM, BARON VON, one of the most distinguished linguists of his time, was born at Potsdam, on the 22nd of April, 1769. He was a man of great learning and a great range of knowledge. He was the son of a wealthy man, and was educated at the University of Göttingen. At the age of twenty, he published a work on the languages of the Indians of the Amazon, and was appointed to a professorship in the University of Göttingen. He was the author of many works on the languages of the South Sea Islands, and was a great authority on the languages of the American Indians. He was a great advocate for the study of the languages of the world, and was one of the first to urge the importance of the study of the languages of the non-Christian world. He was a great friend of the Abbé de l'Isle, and was one of the chief advocates of the establishment of the American College of the Indies at Buenos Aires. He was a great admirer of the work of the Abbé de l'Isle, and was one of the chief supporters of the American College of the Indies. He was also a great friend of the Abbé de l'Isle, and was one of the chief advocates of the establishment of the American College of the Indies at Buenos Aires. He was a great admirer of the work of the Abbé de l'Isle, and was one of the chief supporters of the American College of the Indies.
Cesar, Strabo, and other ancient writers. In the countries
invaded by the Romans, the complexity of the ancient
language was expressed by the Celtae, the Gallicans; and
the Tamarians. (Alcide) are said to have been
probably the same. The second volume also contains a
Mormon on the Limits within which Governments ought
to confine themselves in the care of the welfare of their
Subjects; A metrical German translation of the 1st, 12th,
and 14th of Finde's Olympic Odes; the 1st, 2nd, and
9th of the Thibyan Odes, among which No. 4 appeared
first, with a commentary, in the "Neue Deutsche Monats-
zeit."

Hone (1797); the 4th, 6th, and 9th of the Nemeen
Odes; Forty-one Sonnets printed from MS., &c. The
volume also contains the celebrated critical essay on Goethe's H. Hermann
and Dorothea (1868), which was first published
in the first volume of his "Aesthetische Versuche,"
Brunswik, 1826, 4to., and the memoir of dissident
Sexes on Organic Nature; Fifty-seven Sonnets, from

Berlin, 1828, 4to., is not in this collection. During
the last ten years, Humboldt was actively engaged in
inventing the Malay and American languages; but find-
ing the task above his strength, he abandoned the Ameri-
can languages to his friend Dr. Buschmann, for whom he
secured a position in the Natural History Library in
Berlin, and he devoted his time exclusively to the
Malay languages, on which he intended to write an ex-
tensive work. When he left for Mysore, his first volume was
nearly finished, and it was prepared for the press by Dr. Buschmann
and Alexander von Humboldt, who published it, with a preface of
his own, under the title, "Ueber die Kawi Sprache auf
der Malaiischen Inseln," Berlin, 1826, 8vo., which attracted the atten-
tion of all Europe. The greater portion of this work com-
prehends investigations of the progress of civilization from the
continents of India towards the large islands in the Indian
Sea, which he traces in the monuments, the languages, and
the literature of the different Malay nations; and only a
small portion is devoted to the examination of the Kawi
language. The death of the author is the cause of this im-
perfection; but the work will be thoroughly treated in a second
volume, the materials of which he collected, but left in such a state as to require
the labour of a perfect scholar before they can be published.

Hume, James Deacon, born 28th of April, 1774,
at Newington in the county of Surrey, was the son of Mr. James
Hume, sometime secretary and afterwards a commis-
ioner of the customs, and who was a nephew of Dr. Hume,
bishop of Salisbury. The subject of this notice was sent when very young to Westminster School, and in that establishment
resigned the post of mastership of Dr. Smith and Dr. Vincent
himself his whole of his school education.

In 1790, when at the age of sixteen, Mr. Hume was ap-
pointed to a clerkship in the Custom House, where he soon
became conscious of that energy of character which accom-
panied him through life, so that at an unusually early age
he was appointed to fill an office of much responsibility in the
department. It was a maxim with him, which he frequently
uttered, that a man should never content himself with per-
forming merely his own duty, but that he should at all times
show alacrity in assisting every one requiring assistance, and
in extending to the utmost of his ability the field of his use-
ful exertions. Notwithstanding the difficulties of his position,
Mr. Hume undoubtedly secured his own advancement in life,
and attained to his deservedly high reputation.

In 1796 Mr. Hume married. He had twelve children,
eight of whom (daughters) lived to be women, and seven,
with his widow, survived him. Shortly after his marriage he
fixed his residence in the country, where he lived for
considerable extent of land, and commenced practical far-
mer upon a large scale, not however neglecting his official
duties, but giving daily attendance at his office, for which
he was rewarded by a part of Noyes's estate, the proceeds
before day like, returning to it after dark. He was always
depthly interested in the science of agriculture in all its branches,
and frequently in after-life referred to his practical experience
as a farmer in support of those doctrines of political economy
of which he became a zealous and enlightened advocate. In
1822 he was induced to relinquish his rural pursuits and again
to take up his residence in London. By this time, his value
had come to be so highly appreciated by the government,
means of reports which it became his duty to prepare upon
subjects connected with the revenue; and in the following
year he was appointed to reduce into a simple code the
many hundreds of thousands of statutes of 1500, often
of each other, and not unfrequently unintelligible, which at
that time formed the 'intricate and labyrinthine chaos'
of our custom-house legislation. This work had become one of
necessity for the guidance as well of the government as of the
commercial world. To no other man could its importance
be intrusted with anything like the same propriety.
Three of the most valuable years of his life were devoted to
the task; and to the unremitting labour which he applied to
its accomplishment, his friends attributed that inwardly power which was visible in the latter years of his life, and which, in the pride of his soul, seemed to be more
sooner than with his originally excellent constitution was
to be expected. The labour of the task was intense. During its progress he allowed himself no relaxation, and
acquired the habit, which he kept up, of working twelve hours
out of the night from dinner to breakfast, and keeping the
hours of the night and in the morning. He had also an
turn for the public business, and by the laws by which he
influenced his direction, and in which at the acts prepared by
Mr. Hume introduced clearness, economy, and regularity. In
the eleven intelligible acts of parliament prepared under
Mr. Hume's direction, and passed in 1825, everything was pre-
served that it was desirable to retain, while all that had become
worthless in the many hundreds of repealed statutes was dis-
carded. So intricate and confused had the laws indeed been rendered by successive patch-work pieces of legislation, that
even those persons who had made it the study of their lives
were often at fault in its application, and the decisions of our
tribunals upon this branch was frequently contradictory.

So sensible were the ministers by whom this work was intru-
sted to Mr. Hume's ability with which it was per-
fected, that he was promoted in 1829, by the addition of the
sum of 3000l. over and above the salary of his office,
from the duties of which he had been relieved during the
period devoted to the task; and thereat, therefore, any
question of improved, having been decided by the marts
of the country without his opinion concerning it having
first been obtained. So frequent did these consultations become, that
a room was fitted up for his use in the office of the Board of
Trade; and at length, in July 1829, his services were
wholly transferred to that department, where an office was created
for him as Joint-Assistant Secretary. In the perfor-
mance of the important duties thus intrusted to him, Mr.
Hume used the same degree of zeal and intrepidity which
had marked his previous course, and which secured for him
the respect and confidence of the successive chiefs of the
department.

At the beginning of 1840 the inroads upon his health, caused
by a long life of unremitting labour, were so apparent, that
Mr. Hume's retirement from the public service became in
manner necessary. By this time he had completed forty-nine
years of active service, forty-four of those years having been
passed in situations of responsibility, and he was allowed to
retire on a pension of the same amount as the salary attached
to his office, which appears by a treasury minute presented
to parliament, in which was expressed their lordship's 'full
approval of his good and faithful services, accompanied by their
regret that the public service would be deprived of his retire-
manship.' Mr. Hume's whole of his school education,
attained to his deservedly high reputation.

In 1796 Mr. Hume married. He had twelve children,
eight of whom (daughters) lived to be women, and seven,
municated; and it is probable that at no time during his active career was he able to render more essential services to the best interests of commerce, than by the suggestions made by him after his nominal retirement, and especially by the evidence given by him before the Import Duties Committee of 1853, with which, having been frequently quoted in the condemnation by all parties in the House of Commons, has been brought forward to support measures of reform in our fiscal system proposed and carried in conformity with his recommendations.

After an illness of some weeks' duration, but from which no serious result was apprehended, Mr. Hume was seized with a stomachail, an atypical character, and two days thereafter died, on the 12th of January, 1842, in the sixty-eighth year of his age.

Although Mr. Hume may be almost said to have lived with the pen in his hand, he published but little, the object of his labours being for the most part confined to the preparation of official papers, which may, nevertheless, have exercised a greater influence upon society than could have followed from the publication of his opinions. He wrote several papers upon subjects connected with commerce, which appeared from time to time in the British and Foreign Review. One of these papers, on the timber trade and duties, may be said to have established his reputation. He is better known, however, as the author of a series of letters which, under the signature H. B. T., appeared first in the 'Morning Chronicle' and have since been collected, and more than once reprinted. These letters contain some of the most admirable and unanswerable arguments for various changes in our fiscal system, many of which have since been carried out, while others are evidently on the eve of adoption. Mr. Hume's style partook of the characteristics of his mind, which was vigorous and original.

In the private relations of life, Mr. Hume was remarkable for the most perfect sweetness of temper. With fewer of human weaknesses than are usually found to accompany even the more correct among us, he was ever indulgent to the failings of others; just in his dealings; true to his promises; with a largeness of generosity that, as such things are usually measured by his models, was witnessed by all; and by the most scrupulous delicacy towards those who were its objects. His attachments were strong and stable, and he was the object of the most earnest affection to all who enjoyed the privilege of his close acquaintance.

HUMIDITY is that property of a substance by which it communicates to a body in contact with it some of a liquid which it may have absorbed; and the term is commonly applied to the atmosphere when it is in a state to deposit moisture on bodies in it.

The humidity of the atmosphere is caused in a great measure by the evaporation of water from the seas, lakes, &c. of the earth; and the quantity of moisture with which a volume of air is capable of containing depends upon the temperature: when the latter is low at any part of the earth's surface, the air is dry, with moisture sufficient for holding any more, but the quantity of moisture in a given volume will then be small. If the temperature be increased, the air becomes thereby comparatively dry, acquires immediately the power of receiving more vapour, and the power increases with the temperature, so that, in a given volume of air, the quantity which consists with the state of saturation is also increased. Whatever be the quantity of vapour which constitutes the state of saturation, if the temperature be suddenly lowered, or if there be presented a body which has an affinity for water, a precipitation of the latter takes place, or water becomes absorbed in the body.

The temperature of the atmosphere over any place on the surface of the earth diminishes as the distance of the stratum of air from the surface increases: the power of the air to hold vapour diminishes accordingly; and it may be stated that the humidity of the atmosphere decreases from the surface of the earth upwards. The great dryness of the atmosphere near the summits of mountains has been frequently noticed by travellers, but the difference in the different strata is, from local influences, subject to many irregularities. The temperature of the lower strata of the atmosphere, as well as the latitudes of places on the earth increase, a given volume of air, when completely saturated, will contain less water as a station is farther from the equator; and the like may be said of the entire column of the atmosphere over a station. This may serve to account for the fact that, in general, the weather becomes fine when the mercury rises in the tube of a barometer; for then, by the increased density of the air, the clouds are made to ascend in the atmosphere to a region where, the dryness being great, they are readily dispersed. On the contrary, when the air is rarefied, the clouds descend; and arriving near the earth, they enter a region in which the atmosphere is at or near the state of saturation; and, consequently, the vapours are easily precipitated. But it does not follow, that at the present time the state of the mercury is a more certain prognostication of rainfall than its ascent is of fair weather; the ascent of the clouds in consequence of the increase of air pressure is not sufficient to be accompanied by their dispersion. From the affection produced by high winds, the upper regions of the atmosphere are often charged with aqueous vapour; and rain may then fall while the top of the column of mercury is above its mean height, and even while it is rising in the tube.

The atmosphere often becomes humid from the evaporation of liquids by artificial means. In establishments for brewing, dyeing, and the like processes, the vapours produced from liquids which are constantly in a state of ebullition rise in the atmosphere, and even render it opaque. The breathing of men and animals produces a watery vapour which renders the atmosphere moist. And in summer, when the thermometer is in a small apartment the humidity is sometimes so great that water flows down the walls. The leaves of plants also discharge, in the form of vapour, the water which is embittered by its roots, and in conservatories this effect is particularly sensible.

In order to determine the quantity of water which is contained in earth when completely saturated with rain, Dr. Dalton assumed the density of rain water to be 1.035, after it had fallen copiously during the preceding day, and exposed it to different degrees of heat. When it seemed to have about the same degree of moisture as soil at the depth of two inches from the surface to the top, and it was found that it had lost one-twelfth of its weight; and when it had lost two-ninths of its weight it seemed like the upper soil in summer. His conclusion is that a body of earth one foot in depth contains four inches of rain water when the temperature as indicated by the thermometer is 70° Fahr., and in depth of water, and that it may lose one-fourth or one-half of that quantity without becoming incapable of supporting vegetation.

The effects of humidity on the dimensions of bodies are various: when a watery vapour penetrates between the twisted fibres of cordage, which are vegetable materials, the cordage swells out transversely, and thus becomes shortened; while cords made of animal substances become relaxed by humidity and increase in length. Most salts absorb water, and thereby increase in weight.

HUMIFICA is, BY THE SEEDS of certain plants belonging to the syncarpous group of Polyptetalous Erumaceae. It has the following essential character: the calyx is 5 divisions; the petals alternate with the lobes of the calyx and equal to them; the statocytes are numerous, and exserted, and not be incapsulated. The androecion has 10 stamens, the petals, monadelphous; the anthers 2-celled, with a fleshy connective, extended beyond the 2 lobes; the ovary superior, usually surrounded by an auricular or toothed disk, 5-celled, with from 1 to 2 suspended ovals in each cell; the style simple, the stigma lobed; the fruit drupaceous, with 5 or fewer cells; the seed with a membranous integument, the embryo straight, oblong, lying, in fibrous ashlymen; the radicle superior. The plants belonging to the order are trees or shrubs abounding in a resinous juice, with alternate, simple, coriaceous ex stipitate leaves, and axillary corymb of flowers.

The affinities of this order are not well made out. In their albuminous fruits the slender embryo is free with styrea cea, as also in their balsamic wood. They resemble Meliaceae very much in habit and in their fruitcification, but the anthers and seeds of Humiriacaceae differ very much from those of Menie. The order is known under the name of Menieaceae; and whilst Lindley thinks that their real affinity is with Auran ticaceae; 'an affinity,' he observes, 'indicated by their inflorescence, the texture of their stamens, their disk, their winged petals, the quantity of moisture secreted: by the fruit belonging to this order, Humirium, Helierea, and Socloplegia.'

Humiria DC. (from Omnium, the Guyanese name of one of the species.) The 50 species joined into a tube, the alternate ones shortest, ciliated above, an annular 20 disked, the stigma 5 lobed, the fruit containing a 5-celled nut, the cells 2 seeded. One of the species, H. balansaeformis, is a tree forty
feet in height, with ovate oblong leaves half-clasping the stem. The flowers, produced on the upper part of the stem and sometimes more than one flower to a leaf, are white, longer than the leaves, the peduncles smooth as well as the petals. This tree is a native of Guyana and Cayenne. Its bark is thick, and abounds with a red balsamic fluid, which renders it valuable for medical purposes. The wood is very hard and although those of Holleria and Sacoglottis, yield resinous juices.

(Lindley, Natural System; Burnett, Outlines of Botany; Don, Garden's Dictionary.)

HUNGARY.

There are three of the name of Andrew, or Andreas, who deserve a short

Andrew I., the son of Prince Ladislaus the Bald, and the fourth king of the house of Arpad, reigned from 1046 till 1061. His successor, King Peter, in 1045, had offered Hungary as a duchy to the Emperor Henry III. of Germany; but on his death his son Charles, who was protracted war with the emperor, made a peace with him, in 1052, through which all feudal ties between Hungary and the empire were abolished. During the reign of this king the majority was conveyed upon the throne of Hungary, and Andrew succeeded in introducing the Christian religion throughout his kingdom. Andrew fell in battle with his brother Bela, who succeeded him on the throne.

Andrea I, the son of Ladislaus, was the son of King Bela III. : he succeeded his elder brother Emeric in 1205, and reigned till 1238. During his long reign Hungary was shaken by disturbances and civil and foreign wars, caused by the revolutions and ambitious character of Andrea, whose passions however were more violent than strong. Previous to his accession he waged war with his own brother Emeric, and raised a numerous army. They were encamped in sight of the camp of the nobles minded men, who knew that the partisans of Andrea followed him only through fear, went alone and unarmed, with only a white staff as the symbol of peace in his hand, to the camp of the rebels. When he was in sight of them, 'I shall see,' said he, with quiet dignity, 'whether you will shed royal blood.' None of them dared to stop him, and he thus surprised his brother Andrew in his own tent, and after having reproached him for his conduct, prevailed upon him to submit without making even an appeal to his followers. In this way Emeric carried Andrew from the midst of his own army, and kept him in prison till 1215. He finally appeared, and Andrew was brought before him, and appointed him guardian of his son Ladislaus, who was a minor. After Emeric's death, Andrea seized the royal authority and reigned in his own name for eight years, and then abdicated in 1205, so that Andrea became legally possessed of the supreme power which he had usurped. Andrea was a slave to his brilliant but ambitious queen Gertrud, a princess of Meranum, whose conduct became so unsatisfactory that the principal Hungarian nobles conspired against his life, and during the absence of Andrew in Galicia, in 1213, they surprised him and put an end to her. The conspirators were headed by the Magnate Banco, whom the queen had mortally offended; for in order to take revenge for a slight offence which she pretended to have received from Banco's wife, who was famed for her beauty, Andrea separated her and his brother Berthold to violate the person of this lady, and she afforded him an opportunity of effecting his purpose in the queen's own apartments in the royal palace. In 1217 Andrew undertook a crusade, and made himself conspicuous in Palestine through his gallant deeds, but his final success was trifling, and he returned in 1223: thence he was called 'Hierosolymitanus.' Andrea took an important part in the Byzantine affairs of his time. After the death of the Latin Emperor of Constantinople, Peter of Courtenay, in 1217, the crown of Greece was offered to Andrea, who however declined it, and, in 1218, made a treaty of alliance with Theodore Lascaris, the emperor of Constantinople, which he entered into in marriage to Andrea's eldest son Bela. When Andrea returned from Palestine, he found this prince at the head of an army of rebels, and his kingdom disturbed by a civil war. The power of the noble was so great that in the diet in 1222, which Andrea convoked immediately after his return, they forced him to abdicate and to place on the throne his son, called 'Golden Bull,' which has justly been compared with the English Magna Charta, and by which great privileges were given to the Hungarian nobles, while the royal authority was greatly restricted. This golden bull was the first constitutional law of the kingdom of Hungary and its appurtenances. During the following years Hungary continued to be shaken by civil factions, which the king was unable to quiet, since his natural abilities and his good will were not supported by sufficient steadiness of character. Andrew II. died in 1236, and was succeeded by his eldest son Bela IV.

Andrew III., the son of Prince Stephanus, who was the posthumous son of the woodman Andreas, succeeded King Ladislaus IV. in 1290. His short reign of ten years was signalized by civil disturbances and foreign wars. Andrew compelled Duke Albert of Austria to give up his claims upon the crown of the House of Babenberg, and by his marriage with the daughter of the Emperor, he secured the succession to his nephew the King of Naples, who founded his claim to the Hungarian crown upon his descent from Maria the sister of the last Babenberg. In the same year, Andrew III was the last king of the house of Arpad, the founder of the Hungarian kingdom: and his successor, the fortunate Charles Robert, was the first king of the House of Anjou, who reigned over Hungary during nearly a century.

(Mailath, Count of, Geschichte der Magyaren; Fray, Historia Regum Hugfallorum.)

HUNTINGTON, ROBERT, D.D., was born in February, 1836, at Deobrynt, in Gloucestershire, where his father, of the same name, was parish clergyman. After having received the rudiments of a classical education at the free school of Brixton and a commercial training at 1823 a professor of Morten College, Oxford; and, having taken his bachelor's degree in 1858, he was soon after elected to a fellowship in that college. He took his degree of Master of Arts in 1859, and, after completing himself with great success to the study of the Oriental languages, he was in 1870 appointed to the situation of chaplain to the English factory at Aleppo. This post he held for above eleven years during which time he visited Jerusalem, Galilee, Samaria, Cyprus in 1677, and Egypt in 1680, and again in 1681, besides making an unsuccessful attempt in 1678 to reach Palmyra. His return home was not uneventful: he and his family spent the Christmas time in Dublin; but, after first taking flight on the invasion of Ireland by the deposed king after the Revolution, and then returning to that country for a short time, he resigned in 1801, and once more came over to England. In August, 1802, he was presented by Sir Edward Turner to the rectory of Great Hanglebury in Essex; and while here he married a sister of Sir John Fowell, one of the justices of the King's Bench. He seems still, however, to have felt undootable object, he describes in some of his printed letters as a rustic solitude, where he was banished alike from books and friends, from the living and the dead. It was in 1687 some years after he refused the bishopric of Kilmore in Ireland, his aversion to that country gave way so far that in 1701 he consented to accept of that of Raphoe. But he died there on the 2nd of September in the same year, twelve days after his consecration.

The only literary performance that Bishop Huntington published was a short paper in the Philosophical Transactions (No. 161), entitled 'A Letter from Dublin concerning the Porphyry Pillars in Egypt.' The writer of his Life in the Biographia Britannica states that some of his observations are printed in Ray's Collection of curious Travels and Voyages, 2 vols. 8vo, 1667, but all which that work contains is the Letter on the Porphyry Pillars, which is in volume ii., pp. 149-155. At the end of the reprint is a notice extracted from the Journal des Savans (No. 36, A.D. 1692), of a letter from M. Corhey to the Abbé Néricault, intituled that book, "The Natural System," 1816, a work which was considered a valuable contribution to the science of botany.

HUN

In 1836, Robert Huntington, D.D., was born in Gloucestershire, England. He received a classical education at the Free School of Brixton and a commercial training at Morten College, Oxford. Huntington was elected to a fellowship in Oxford College, where he studied the Oriental languages and completed himself with great success. In 1870, he was appointed chaplain to the English factory at Aleppo, a position he held for over eleven years. During his time in Aleppo, Huntington visited various parts of the Middle East, including Jerusalem, Galilee, Samaria, Cyprus, and Egypt. He was presented by Sir Edward Turner to the rectory of Great Hanglebury in Essex and married a sister of Sir John Fowell, one of the justices of the King's Bench. After a brief period in Ireland, Huntington settled in England again, where he wrote a short paper in the Philosophical Transactions. The writer of his Life in the Biographia Britannica states that some of his observations are printed in Ray's Collection of curious Travels and Voyages.

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he had just heard from Aleppo ' that some English gentle-
men, out of curiosity going to visit the ruins of Palmyra, had
found 400 marble columns, of a sort of porphyry, and also
observed some temples yet entire, with tombs, monuments,
Graeco-Roman inscriptions of all sorts, and which he hop-
ethe copies. This would probably be the earliest information
received by the English public of the successful accomplish-
ment of the first modern journey to Palmyra, which was
achieved by some gentlemen of the factory at Aleppo in 1691,
and of which a full account was given in the 'Philosophical
Transactions' for 1695. Ray's book may have been printed in
the latter part of 1692, though not published till May, 1693.
The first edition of which month the book was first printed.

Dr. Huntington is principally remembered for the numer-
orial Oriental manuscripts which he procured while in the East
and brought with him to this country. Besides those which
he purchased for Archbishop Marsh and Bishop Fell, he ob-
tained between six and seven hundred for himself, which are
now in the Bodleian Library, to which he first presented thirty-five of them, and then sold the rest in 1691 for the
small sum of 700l. Huntington, however, missed what was
the principal object of his search, the very important Syriac
version of the epistles of St. Ignatius, a large portion of which
was at length recovered in 1848 by Mr. Tattam from one of the
monasteries in Nisibis which was burnt in the course of his inquiries, and, having been deposited by
him in the British Museum, has been published in the present
year under the care of the Reverend W. Curteon, keeper of
the manuscripts at the British Museum. Several extracts in
Huntington's letters, which are addressed to the Archbishop
of Mount Sinai, contain inquiries about the MS. of St. Ignatius;
and other inquiries are made in his letters to the Patriarch of Antioch.

There is a Life of Bishop Huntington, in Latin, by Dr.
Thomas Smith, at the end of which are thirty-nine of his
Letters, all in Latin, published in 1804, at London, in 1704; and
he is the subject of an article in the 'Biographia Britannica.'

HURA, a genus of plants belonging to the natural order
Euphorbiaceae. It has noneconomic, amanitaceous flowers;
the stamens are united into a column; the pistillate flowers with
the style single, and the stigma with 12-18 rays, and the capsule
with 12-18 cocci. H. creptans is a tree abounding with
milky juice. It is a native of the West Indian Islands,
Mexico, and Guyana, where it is called 'Sandbox,' or 'Mon-
key's Dinner-Bell.' It has coriaceous, acuminate, entire or very
slightly toothed, stalked, smooth, coriaceous leaves, with simple
veins passing from the midrib to the margin, in a curbed
direction, within a quarter of an inch or so of eachother,
and connected by numerous oblique veins; large, ovate,
leafy, deciduous stipules, and petioles as long or rather longer
than the blade of the leaf; 2 glabrous leaves at the base of
this tree is a deepened umbilicate woody capsule, about
the size of a middling apple, with from 12-18 furrows which
separate it into segments; the furrows separate into 2
valves, and files asunder with great elasticity when dry and
fully ripe. The noise the fruit makes during the process of
the drying of the fruit has obtained for it the common names.
The juice of the dried pulp of the allied genus Rumicaria (P.
C. S.) is exceedingly acrid, and a small quantity touching
the eye will produce blindness. The seeds, like those of
Croton and Ricinus, contain an acrid oil which is a drastic
and dangerous poison.

(Lindley, Flora Medica; Burnett, Outlines of Botany.)

HURRAN, called also Hurrar and Adhari, is a country
with a large commercial town in the eastern part of Africa,
and situated between the Nile and the Athoh. The capital is
Ankober, the chief town of Shoa, and one of the most
productive countries in the world. The inhabitants are mostly
black people, and many of the principal inhabitants have houses of two stories. There are
said to be many mosques within the town, forty-four of which are the abodes of learned men.
The town is well supplied with water from the numerous springs in its vicinity. Close
to the town is a river called Sambii.

The inhabitants are rigid Mohammedans, and pay strict
attention to the fasts and ceremonies enjoined by that religion.
According to D'Abbadie there is a law in force which pro-
hibits any white man, that is, any Turk or European, from en-
tering the town of Shoa, and the country is divided into
three parts, called Hurri, or the sea-coast, Hurri, or the
interior, and Hurri, or the mountainous country. Each part
must be large, as the houses are said to be built very close
gether. The principal occupation of the people is that of
felling the soil, which for several miles around is highly culti-
vated, producing coffee, cotton, wheat, barley, and a vast
quantity of fruits and vegetables. The Aata (a small plant, the leaves
of which are said to possess an intoxicating quality, and o.
which the Arabs in Yemen, where it is also found, are ex-
ceedingly fond) must be of abundant. The ground is irrigated by artificial means from numerous springs. Coffee
is the most important article produced; at least 2000 baies are
annually exported to the sea-coast, to the port of Bur-
burah and Zeila, and thence to Arabia, where it is mixed
with that of Mocha, which is improved by it. It is said to
differ from that of Arabia, the fruit being a large flat berry.
A few families are occupied in manufacturing industry. There
are weavers, blacksmiths, and gold and silver smiths. The
lances made in Hurran are in very high estimation.

Hurrar may certainly be considered, for that country, a
great commercial town. Kaftans arrive there or depart at all
seasons. They are obtained in large quantities from the
Nile and the Athoh. The Arabs and the Europeans who have
traded at Shoa and Burburah and Zeila, which two last-mentioned places may be considered as the ports of Hurran. Three kaftans are
exported for Burburah between the months of October and
March, and 20 kihmah for Zeev or Zelat, consisting com-
Pletely of 2000 camels. They export coffee, jowari, ghee, ostrich feathers, gum, myrrh, and wax; the last-mentioned article is
considered to be the most valuable and is used as a presen-
tment for cooling the body; it is also mixed up with flour and
made up into cakes, which are said to be very palatable.
They export also to Burburah slaves, both male and female,
and receive in return blue and white coarse cloth, Indian
piece goods, European prints, silk, silk-thread, red cotton-
yarn, beets, zinc, copper-wire, frankincense, and some smaller
articles. There are also annually three kaftans to Zeila. The
Arabs are so particular about their kaftans and the other
exports are increased by some articles, as wheat, millet, beans, &c.

smaller kaftans depart almost every month to Shoa, except
during the rainy season. They chiefly export articles ob-
tained from Burburah and Zeila, especially blue cloth, red
cotton-yarn, &c., and receive in return slaves, mules, and
horses. Other kaftans trade between Hurran and Arusie and
Chercher, two towns or encampments of the Gallas, situated
west and south-west of Hurran; the articles of export and
import are imperfectly known.

The climate of Hurran is said to be similar to that of Shoa,
but not quite so cold. The language bears an affinity to the
Amarah, or Amhara, which is the mother tongue of the
definite character is used in writing. The ruler of Hurran has
the title of Emir, and the succession is hereditary. He is fre-
quently at war with the Abyssinians, who also separate into two
sections, the Southern and the Northern, the former
being better governed, but his kingdom is in check by a small force armed with
matchlocks, by which the Gallas have a great dread of fire-arms.

(Barker, Report on the probable Geographical Position of
Hurrar and Adhari, from the Narrative of a Traver-
ser, Account of the North-East Coast of Africa, in London
Geographical Journal, vol. xiv.; D'Abbadie, Letter: Rigby,
Remarks on the North-East Coast of Africa, in the Trans-
actions of the Bombay Geographical Society, vol. ii.)

HUSKISSON, WILLIAM, was born March 11, 1770,
at Birch Moreton Court, Worcestershire, where his father
occupied an extensive farm. The family had long been set-
ched in Shoa, or Abyssinia, the capital is Shoa, and the hab-
bour of Burburah. As the place has not been visited by Europeans, its true situation is not
known, and our information about it is derived from the ac-
counts of some natives of the adjacent countries.

According to these accounts, the town is so large that it
takes two hours to go round it at a quick pace. It is sur-
rounded by a stone wall about ten feet high and three feet thick, and kept in good repair. There
are five gates. The houses are generally built of stone and
whitewashed, with flat roofs. There are however some few
thatched. The climate is very hot, and mud
the inhabitants have houses of two stories. There are
said to be many mosques within the town, forty-four of which are the abodes of learned men.
The town is well supplied with water from the numerous springs in its vicinity. Close
to the town is a river called Sambii.

William Huskisson was sent to Paris, at the request of his maternal uncle, Ir.
Mr. Huskisson, and remained there. His Abroad. The principal inhabitants have houses of two stories. There are
said to be many mosques within the town, forty-four of which are the abodes of learned men.
The town is well supplied with water from the numerous springs in its vicinity. Close
to the town is a river called Sambii.
do 1789,' established in 1790. The object of this club was to secure the 'intellectual navigation' of France, with it led to the charge which was often brought against him of having been a member of the Jacobin Club. In August, 1790, he pronounced a 'Discours' at the 'Société de la Découverte,' which reached a large extent, which obtained for him the time considerable celebrity in the French capital. He withdrew from the 'Société' after the legislature had determined upon the issue of assignats. In the same year (1790) he became private secretary to Lord Gower (afterwards the Marquis of Stafford), who was then the English ambassador. A letter dated a few days after the attack on the Tuilleries on the 20th June, 1792, shows that Mr. Huskisson was acutely aware that the Revolution had undergone a change. After the events of the 10th of August, 1792, the English ambassador was recalled, and Mr. Huskisson returned with him to England. He continued to prove great interest under Mr. Dundas, and was soon distinguished by his talents for business. In the 'Biographical Memoirs,' attached to the edition of his 'Speeches,' it is stated that he was often called to the private councils of the First Lord of the Treasury, Lord George Greville (afterwards Earl Grey's) expedition to the West Indies. Towards the end of 1796 he was brought into parliament as member for Morpeth, by the Earl of Carlisle; but he did not speak as a speaker before February, 1798. On the retirement of Mr. Pitt he resigned his official situation. He was unsuccessful in procuring a seat at the general election in 1802, and did not appear again in Parliament until 1804, when he sat for Liskeyard. He was secretary of the Treasury under the administration formed by Mr. Pitt in 1804; and after the death of that minister, and during the Whig administration of 1806-1807, he was an active member of the Cabinet. He was re-elected for Liskeyard; and after the dissolution of Parliament in 1807 he sat for Harwich, and continued to do so until 1812. From 1812 to 1823 he represented Mr. Lord Chichester, in which neighbourhood he had, in 1801, purchased a small estate. From 1823 until his death he represented Liverpool. On the retirement of the Whigs from office in 1824, Mr. Huskisson resumed his former post as secretary of the Treasury. In 1807 he was strongly invited by the Duke of Richmond, then viceroy of Ireland, to become chief secretary; but his services could not at the time be dispensed with. He retired from the office in 1809, along with Mr. Canning, when the latter left the ministry on account of differences with Lord Castlereagh. He refused from motives of friendship and personal attachment to his colleague to ask the restoration of his own position on the exclusion from power; and it was not until Mr. Canning accepted the post of ambassador at Lisbon, that Mr. Huskisson again entered the public service. In August, 1814, he was appointed Chief Commissioner of Woods and Forests. In 1823 he became President of the Board of Trade, and Treasurer of the Navy. His predecessor had been a cabinet minister, and Mr. Huskisson considered that his position entitled him to the same distinction, and after some debates occasioned by the cabinet already consisting of a larger number than usual, he became one of its members. After the death of Mr. Canning, in 1827, Mr. Huskisson's influence in the House of Commons increased; and he continued to hold his cabinet post. In 1828 he was appointed secretary for the Colonies in Lord Goderich's cabinet; and he retained his post when this cabinet was broken up and the Duke of Wellington became the head of a new ministry. He had to defend himself for remaining in office after his friends in the former cabinet were excluded from power; and he did so on the ground that the measures to which he was more particularly pledged would be followed up by the then existing administration. On the 12th of May, 1828, the debate on the East Retford Disenfranchisement took an unexpected turn, and Mr. Huskisson was called upon to redeem a pledge which he had given in a former discussion on the question; and he was heard with respect by his colleagues. After the debate, at 2 A.M. he wrote a note, as a matter of delicacy and courtesy to the Duke of Wellington, the head of the cabinet, placing his resignation in his hands. Without any communication with Mr. Huskisson, the duke laid it before the king. In the correspondence which ensued it is evident that the Duke of Wellington was desirous of obtaining the services of Mr. Huskisson. He had once before voted against his ministerial colleagues, in opposing, in 1822, Lord Londonderry's resolutions for re- lying the agricultural interest. In the request of Lord Liver- pool, the prime minister, he remained firm. The nomination of Mr. Huskisson was followed by that of Lord Palmerston, Mr. Grant, and several others who had belonged to the Whig party. In both cases it became evident that the commercial principles were held by him in common with them, and in his general views he was approximating towards the Whig party. He had always been in favour of the Catholic claim, and in opposing the repeal of the Corporation and Test Acts, he did so on the ground of its being a partial measure, and likely to retard Catholic emancipation. He supported in May, 1829, Mr. Grant's bill for reining the year of their disabilities. He was known for having supported a measure of reform, and in the same session he had voted in favour of giving representatives to Manchester, Leeds, and Birmingham. In parliament Mr. Huskisson seldom spoke except upon financial or commercial subjects. He was an active member of the Bullion Committee, and defended the principles in the Report of that committee. He was one of the Committee of Inspection concerning the Depreciation of our Currency stated and examined,' which was published in 1810. In the debates on the corn laws, in 1814, he supported the system of protecting the agriculture by keeping the price of corn low, and that corn and manufactures were similarly protected, and that our whole system was one of artificial restraints. He was at that time merely for free trade in the abstract. He alluded to the possibility of imported corn becoming one-third, instead of one thirty-fifth of our consumption, if proper means were not taken to encourage the home culture. He was averse to the country being dependent on foreigners, and thought such a country was best provided with corn for the common use. He proposed a sliding scale of duties, according to which the duty would be 8s. 6d. when the average price of wheat per quarter was 68s., and as the price rose the duty would fall, so that at 80s. there would be no duty at all. Corn from the colonies he would have admitted at one-half the rates of foreign corn. The question was postponed to the following year; and he supported the corn-bill of 1815, and thought that less than 80s. as a protecting price would not remunerate the farmer. In the session of 1822 he moved a series of resolutions on the state of agriculture, one of which proposed that when wheat should be sold at 3s. 6d. a quarter the price of 15s. should be permanently charged on the importation of foreign wheat. The experience of the last twenty-five years does not prove the profundity of Mr. Huskisson's views on this subject. In 1827, when a new Corn-law was passed, he proposed that the corn-laws must be viewed in relation to the changes in the growth and price of corn abroad as well as at home; and he abandoned the corn-bill which had been brought in by the government, after the Duke of Wellington had carried an amendment the effect of which would have been to prohibit the release of bonded wheat so long as the price should be less than 68s. the quarter. In 1819 he was appointed a member of the Committee left the same. It is understood that he was principally concerned in drawing up the long Report of the Committee of Agriculture which sat in 1821. It advocated a relaxation of the corn-laws, for which he was never forgiven by the landed interest. In 1827 Mr. Wallace and Mr. Robinson (now Earl of Ripon) had taken some preliminary steps for relaxing restrictions on commerce; and there had been great hope that the movement would carry on a larger scale by Mr. Huskisson. In 1829 he carried through parliament an act for enabling the king in council to place the shipping of foreign states on the same footing with British ships, and to give to British ships in the ports of such states. He abandoned the old restrictive system of colonial trade, and, under certain regulations, threw open the commerce of the colonies to other countries. He assumed a great deal of operation in the search which had been imposed for the protection of the home produce. The shipowners, and the silk manufacturers, and a host of other interests were now in arms against him. They represented him as a cold and heartless theorist, and
he was attacked very generally, both in and out of parliament, for his departure from the ancient commercial policy of the country. His speeches in Parliament in defence of his measures are his best; and his expositions of the commercial consequences of the system always carried great interest. Sir H. Parnell (Lord ConLongton) has denied that Mr. Huskisson established free trade, but he states that in his speeches in 1825 he certainly proclaimed and proved the policy of this system, and that he was the best advocate of free trade in the House of Commons. He did not make the same mistake between the free-traders and the prohibitionists in taking a duty of 30 per cent. as the standard of resolution; and hints, that, had he thoroughly espoused the cause of free trade, he would not have thrown overboard the merchant principle of taking a duty. He had of making improvements in his plan of 1825. (Financial Reform, p. 75.) But even the reforms which he did affect excited great clamour to opposition; and the advantages of the changes he had effected were not recognised until some time afterwards. Mr. Huskisson was active in procuring the repeal of the combination laws; and he relaxed the restrictions on the exportation of machinery.

At the close of the session of 1828 Mr. Huskisson left London to be present at the opening of the Liverpool and Manchester Railway, on the 15th of September. When the train reached Parkside, near Newton, he got out of the carriage, and was immediately attacked by a Duke of Wellington, when an alarm was raised on the approach of an engineer on the other line. Mr. Huskisson attempted to regain his seat, but was prevented from doing so by the heat of the debate. He was dreadfully injured. He was conveyed to the house of the Rev. Mr. Blackburne, of Eccles, but the shock to the system was so great, that after enduring great suffering for a considerable time, he died at nine o'clock the same evening. At the request of a large and influential portion of the mercantile classes of Liverpool his remains were interred in the new cemetery, where a handsome monument with a statue was erected to his memory by his constituents.

Mr. Huskisson was married in 1799 to the youngest daughter of Admiral Milbanke, but had no family. On retiring the wealth in 1828 he entered upon the receipt of an income of six pensions of 3000l. a year, which the Crown was empowered to grant for public services. He was nominated for this pension by Lord Liverpool shortly before his political demise. He was for many years Agent for Ceylon, the saloon of which was increased from 800l. to 1200l. a year: he resigned this post when appointed to the Board of Trade in 1823. (Speeches of the Right Hon. W. Huskisson, with a Biographical Memoir, 3 vols. 8vo., London, 1831.)

HUTCHINSON. [THIRLSTED, F. C.] HUTTON, WILLIAM, was born at Derby, of poor parents, on 14th July, 1758. By fine internal integrity he raised himself to opulence and eminence. It has been said of him, that in many particulars of energy, perseverance, and prudence he deserves to be called the English Franklin. The speed of his progress was due to his own industry, and the work in the silk-mill at Derby, which occupation he quitted at seventeen, and was bound apprentice to an uncle at Nottingham, who was a stocking-maker. He ran away during his apprenticeship, and wandered as far as Birmingham, the town in which he subsequently acquired a fortune; but distress compelled him to return to his uncle. The poor remuneration which he obtained for his labours at the stocking-frame induced him to look anxiously towards some other means of gaining a livelihood; and in 1768 he bought an old worn-down press, and taught himself the art of bookbinding. In 1769 he went to London and began as a publisher and bookbinders' tools. In the same year he commenced attending Southwell, fourteen miles distant from Nottingham, on the market-day; and here he rented a shop at twenty shillings a year, and opened it for the sale of books. In his autobiography he says: 'During this rainy winter I set out at five every Saturday morning, carried a burden of from three pounds' weight to thirty, opened shop at ten, starved in it all day upon bread, cheese, and half a pint of ale, took from one to six shillings, shut up at four, and by trudging through the solitary night and the deep roads five hours more, I arrived at Nottingham by nine, where I always found a mess of milk porter, which was my dinner.' He had prepared by way of preparation for his industry; his uncle's sister was a woman of superior mind, and he owed much to her encouragement. His object was to save a small sum to enable him to commence business in a large town; and in 1769, after having twice visited Birmingham in order to see the chances of success which the place offered, he on the third visit took the lesser half of a small shop, at a rent of one shilling per week, and furnished it with a small supply of books. The overrears teased him for two years under the pretence that his shop was not large enough. He was so dejected that he applied to Mr. Toynbee, the well-known shopkeeper at Birmingham in that year, but after great difficulty he succeeded in recovering 880l. from the county. He now relinquished business in favour of his son. He had filled successively all the principal offices in the local society, and had been a member of the grammar school and the Along of Birmingham; and this was followed by other works in the following order: 'Journey to London,' 1784; 'The Court of Requests,' 1784; 'The Hundred Court,' 1785; 'History of Blackpool,' 1786; 'Battle of Bowbrook Field,' 1789; 'History of Derby,' 1790; 'The Barbers, a Poem,' 1798; 'Edgar and Efrida, a Poem,' 1798; 'The Roman Wall,' 1801; 'Remarks upon North Wales,' 1801; 'Tour to Scarborough,' 1808; 'Poems, chiefly Tales,' 1808; 'Trip to Coatham,' 1808.

Mr. Hutton died September 20th, 1815, a few days before the completion of his ninety-second year. In 1816 his daughter, Miss Hutton, published a Life of Mr. Huskisson, of Birmingham, and the History of his Family: Written by Himself.' This work is one of the most entertaining and instructive pieces of anecdote and reminiscence in the English language. The second edition of the work was published in 1841, in a series of Knight's English Miscellanies.' This edition contains some interesting notes by Catherine Hutton, Mr. Hutton's daughter, who was born in 1785. A list of the most important personal nature from Hutton's works are added as notes.

HYBRID PLANTS. [SEEDS OF PLANTS, F. C.] HYDATICA, a genus of fossil plants (probably aquatic) from the coal formation. (Arcts.)

HYDE, SIR NICHOLAS, was appointed chief justice of the King's Bench in 1626. He was the uncle and predecessor of the first Earl of Clarendon, whose mind he had great share in forming. Mr. Hyde's former commitment for the nonconformity of Sir Nicholas Hyde presided after his elevation to the bench was the one in which Eliot, Hollis, and Valentine were indicted for forcibly holding down in his chair the speaker of the House of Commons, and for conspiring to effect the exclusion of Prince Charles. The court refused to allow to the prisoners their Habens Corpus, and inflicted fines upon them of considerable amount. This conduct (Sir Nicholas Hyde's curious apology for which was that his interests were engaged by his nature) was detested by the court, and was indorsed by the long parliament a delay of justice. He died at his seat (Hinton Lodge), in the parish of Catherington, Hampshire, on the 25th August, 1651, aged 69.

Whitelock, his colleague on the bench, and political opponent, records that the cause of his death was a hot fever, rendered incalculable by reason of an imposthume breaking in his head; and that he died in his place of chief justice with great integrity and uprightness, and with great wisdom of temper, considering the ticklishness of the times.' (Rushworth, vol. ii. p. 111.) Four of his letters are extant in the Bodleian Library. A very proposition of this group, and is much quoted in the controversy, exists in the obsolete parish church of Catherington, Hants. He was succeeded in his estate by his son, LAWRENCE HYDE, who became principally remarkable for the personal share which he had in furthering the escape of Charles II. after the battle of Worcester. The king in his memorable wanderings was concealed for a night at the house of one of Mr. Hyde's tenants. But as this tenant was too fat-headed a rustic to be intimately instructed with the secret of his guest's quality, the king was accordingly passed off as a roundhead, and was in that character compelled to drink what must then have appeared hopeless success to the royal cause. After several days Mr. Hyde's house at Fenton, the house of Lord Southampton and Mr. Hyde, and by them safely conducted the next day to Shoreham, where they succeeded in procuring a passage for him to Fécamp. The circumstances are told in detail in a manuscript written by Mr
The tension or elasticity of watery vapour corresponding to every degree of Fahrenheit's thermometer, from zero to the point of boiling water (measured by the height in inches of the column of mercury which the vapour will support when the density of the atmosphere is represented by 30 inches), has been determined by Dr. Dalton for the purpose introduced a small quantity of water into the vacuum of a barometer, and observed how much, at different temperatures, the vapour arising from it depressed the column of mercury; and a table of the tensions is published in the fifth volume of the 'Manchester Memoirs.'

Previously to stating the manner of determining the relation between the intensity of an hygrometer, and orræææ, a cavity, a genus of plants belonging to the natural order Umbelliferae, and the sub-ord. Order Dehespermeae. It has the tube of the calyx rather compressed, the limb with an obsolete margin, the petals ovate, entire, acute, with a straight apex; the fruit flatly compressed from the sides; the carpels without vitre; the 5 ribs or nerves nearly siliferm, the carinal and lateral ones unusually obsolete, and the two intermediate ones joined. The species of this genus are generally bog-horsetails, but few of them are under-shrubs. The umbel is single, surrounded by a few-leaved involucrum. The flowers sessile or pedicellate, white.

Of the large number of species of this genus few if any are used in the arts or medicine, and none of them are sufficiently ornamental to lead to their cultivation. H. Azutica is said to be used in India as a diuretic and occasionally as a culinary vegetable. H. umbellata is recommended by Martius as a diuretic. It is said to be not infrequent in certain parts of the United States. The fresh juice acts as an emetic. It is said to possess an aromatic odour and an agreeable taste. The species of Hydrocoryne are easily cultivated; they must all be kept under glass and should be grown in pots placed in pots of water. (Don, Gardener's Dictionary; Burnett, Outlines; Babington Memoirs.)

HYDROCACYANIC ACID. [Fumaric Acid, P. C. S.]

HYDROSTATIC BED. [Bedford, P. C. S.]

HYGROMETRY is that part of natural philosophy which relates to the determination of the quantities of bodies, particularly of the atmosphere: it comprehends also the theory of the instruments which have been invented for the purpose of ascertaining the quantity of water contained in a given volume of air.

The experiments of Dr. Dalton have proved that the water received from the earth is not dissolved in the atmosphere, and that it exists there in the form of vapour. That philosopher discovered also that the quantity of vapour contained in a portion of the atmosphere depends greatly upon the temperature of the latter, and that it is very variable even when the temperature is constant. He ascertained moreover that when a quantity of aqueous vapour at a given temperature is diffused through any space, it will support the same external pressure, whether previously that space had been void or occupied by air. On these principles are founded the methods which have been suggested for obtaining the quantity of moisture in a given volume of air by means of the hygrometer: the requisite data being the elasticities of aqueous vapour at different temperatures, and the corresponding indications of the instrument.
the maximum tension at their respective temperatures: this supposition is not quite correct; but it may be presumed that, in using Biot's table for temperatures differing from 50° (Fahr.), the error in the tensions will not be considerable.

Gay Lussac having proved that vapours, whether those of pure water or such as consist of different kinds intermixed, while they retain their character of elasticity, suffer the same variations of pressure as are suffered by permanent elastic fibres, determined, by subsequent experiments, the volumes of the vapour produced by a given weight of water at given temperatures and under given atmospheric pressures. If a known quantity of moisture is in a given volume of vapour. The results of his experiments were reduced to a formula by Biot; and subsequently, with certain modifications, to one in English weights and measures by Dr. Anderson, the writer of the article on Hygrometry in the 'Edinburgh Encyclopaedia.' This formula is:

\[
G = \frac{447.4 \times 10^5}{F + E} + P
\]

in which \(G\) is, in grains, the quantity of moisture in a cubic inch of vapour at the temperature represented by \(F\) (Fahrenheit's scale), \(E\) is the elastic force of the vapour at the same temperature, and \(P\) is the height of the baromterical column in inches at the time of the experiment. It agrees nearly with that which was obtained by Dalton from experiments on the state of the thermometer at the dew-point [HUMORES, P. C.], the height of the mercurial column in that result being 30 inches. From this formula, the temperature \(F\) between 30 inches and 31 inches at a pressure of 0.376 atmospheres (Dalton's table of the elastic force of vapour corresponding to that temperature and that density of the air), we have \(G = 0.002477\), the grains of moisture in a cubic inch of the vapour.

The value of \(G\) being thus found for any given states of the barometer and thermometer; the weight of moisture, in grains, in a cubic inch of air of the like density and temperature, and consequently to any observed degree of dryness, Sausseur's hygrometer may be obtained on multiplying that value by the number in Biot's table corresponding to the observed degree and dividing it by 100; this division must be made because, in that table, 100 represents the elasticity of the vapour when in the state of complete saturation.

The extreme points on the scale of an hygrometer acting by the elongation of a material, like those of Sausseur and De Luc, may be found in the following manner: the instrument is to be placed under a receiver in which is a certain quantity of dry caustic alkali; when, after a time, the material will contract in length as much as its nature will permit; the point on the scale at which the index stands is that of extreme dryness, and constitutes the zero point. The instrument may then be placed in water, or in a receiver filled with vapour corresponding to 40 degrees of dryness; the material will expand to the greatest extent possible: the place of the index is then to be considered as the point of extreme humidity, and is usually indicated by 100.

The instrument consists of a glass tube bent so as to form two equal branches parallel to one another, and each terminating with a hollow ball in which is introduced sulphuric acid, coloured. One of the balls is covered with cambric, which is kept constantly moist by water from a neighbouring vessel; and the evaporation of the water, by cooling that ball, allows the air in the other, by its superior elasticity, to depress the acid in the tube below and force it to rise in the other. The degree of evaporation depends partly on the temperature, and partly on the state of the surrounding atmosphere with respect to humidity; and hence the depression of the acid in the tube, being measured by a convenient scale, affords an indication of the relative dryness of the air. In order to determine the absolute quantity of moisture in a given volume of the atmosphere by the state of his hygrometer, Leslie, having found from some experiments of the kind, that for a given degree of temperature and such of water, and having ascertained that the quantity of caloric necessary to convert a given volume of water into vapour was expressed by 6000 degrees of his instrument; concluded that the same quantity of caloric would raise an equal volume of air to a temperature expressed by \(F \times 4000\), or 16,000 degrees of the instrument; and consequently that, at the temperature of the water, the cubic air contains a quantity of moisture equal to \(\frac{4000}{F}\) part of its weight for each degree; the scale between the points of extreme dryness and extreme moisture being divided into one thousand parts. (Treatise on the Relations of Air to Heat and Moisture.)

From the fact that the elastic forces of pure vapour and of vapours mixed with atmospheric air are equal to one another, and from the expansion of each in consequence of being saturated with moisture may be found.

For if \(V\) represent a given volume of dry air, \(V'\) the volume, when saturated, and \(B\), in inches, the height of the baromterical column; then the elastic force of the air under the increased volume \(V'\) is \(\frac{V}{V'B}\). Now \(F\) representing the elastic force of the vapour in inches of mercury, which, for the given temperature, may be found from Dalton's table; the sum of the elastic forces of the air and the vapour will be expressed by \(F + \frac{V}{V'B}\); and this being made equal to \(B\), the pressure of the atmosphere, the value of \(V' - V\) may be found. Making \(V = 1\), that value expresses the expansion in a fractional part of the volume of dry air.

At any place on the surface of the earth, the mean temperature at which moisture begins to form in the atmosphere may be found from Dalton's formula \(E = M (F - F')\), in which \(E\) is the number of grains evaporated in one minute from a given volume of water in a cylinder 1 inch in diameter and one inch deep, \(F\) is the elastic force of vapour in the atmosphere at a given temperature, which may be the mean temperature at the place (50° Fahr., for Great Britain), and \(F'\) the elastic force of the moisture begins to form: \(M\) is, in grains, the evaporating force in an atmosphere supposed to be perfectly dry; and Dalton's table gives a table of such forces for different temperatures, the atmosphere being at rest, in gentle, and in violent motion. In the table, the temperature being 121°, the height of the baromterical column 30 inches, and the wind blowing moderately, the value of \(M\) is 154; and substituting this value in the formula, we have \(F' = F - E\).

The mean annual evaporation in Great Britain is 0000456 inches or 01155 grains per minute: this last number being multiplied by the contents of a circle 6 inches in diameter gives 0.2820 grains per minute (= E) from a vessel of that magnitude; hence \(F' = F - 0.0647\). But, by Dalton's table, the elastic force \((F')\) of vapour at a temperature equal to 50° is expressed by 0.376, in inches of mercury; hence \(F = 3.103\) inches. Substituting in the above formula for \(G\) this value of \(F'\) in place of \(F\), and 30 inches for \(B\), we get 0.0203 for the number of grains of moisture in a cubic inch of air corresponding to the depression of temperature 4° in the elasticity \(F\) is found to respond the temperature 44° 16' which may be found by inspection in a table formed to contain the values of \(G\) for different degrees of temperature.

HYMENOSPERMAE, from Hymen, in reference to its twin leaves), a genus of plants belonging to the natural order Leguminosae. It has a calyx furnished with two bracts at the base; the tube tubinate, coriaceous; the limb 4-5 parted, deciduous. The lobes sometimes reflexed, and prominent at the base nearly equal, glabular; 10 stamens distinct, inserted in the middle; the style filiform; the legume woody, oblong, many-seeded, containing fuscous; the embryo straight. The species are trees, with bifoliate leaves, and corymbs of white or yellow flowers.

H. Courbarli, Locust-tree, or Guan-Anine Tree, has oblong ovate leaves, unequal-sided, and unequal at the base, ending in a long point; with the legume oblong, compressed, yellowish, shining. It is a fine lofty spreading tree, and grows in the tropical parts of America and in Jamaica. The seeds are enveloped in a cellular mealy aril, and are covered, as it were, like honey, and is eaten by the Indians with great avidity. When fresh it is slightly purgative, but by keeping it loses this property. A decoction of this substance, when allowed to ferment, forms an intoxicating drink resembling beer. From between the principal roots of this tree there exudes a fine transparent resin, with a red or yellowish red colour, and which is collected in large lumps and sold under the name of Guan Anine or Guan Annni. This resin resembles amber, is very hard, and sometimes contains leaves, insects, or other objects imbedded in it, which remain in a perfect state of preservation. It burns readily, emitting a very fragrant smell. (Dioscore) The smooth surface of which has a kind of varnish. According to Lindley, this resin is called Jasatyly, Jatschy, or Capol, and in Minas Gerais Jacoba. Courbarli is the name of the tree in some parts of South America. In countries where this tree grows the resin is
used medicinally, and has also been employed in that way in Europe. It acts as a stimulant when taken internally, and as an irritant when applied externally. In fumigation it has been employed for persons labouring under asthma and dyspnoea. Dissolved in spirits of wine or oil it is used as an embrocation in rheumatism. Internally, it has been used as a substitute for guaiacum, in venereal disease and chronic rheumatism. The inner bark, either in the form of tincture or decoction, is administered as a vermifuge. The cudnones have a method of mixing it with sugar and rum, so as to make a very agreeable emulsion or syrup. The wild bees are fond of building their nests in the trunk of this tree. The timber of the old trees is very hard and tough, and is in great request for wheelwork, and for other purposes for which it is durable. The wood is so heavy that a cubic foot is said to weigh a hundred pounds; it takes a fine polish.

Several other species of Hymenocera are described, but of these comparatively little is known. (Don. Gard. Dict.; Lindley, Flora Med.)

HYMENOMYCETES, the first suborder of the Fungi, a natural order of plants. [Fries, P. C] They are characterized by their reproductive organs, called the hymenium, being naked. This suborder is divided by Fries into four tribes (Fungi, P. C.); by Berkeley into six tribes. Those of the latter are, Pileata, Clavata, Clavati, Mitrata, Copulata, Tremellata, and Sclerotiaceae.

The tribe Pileata contain the following British genera:—

Agaricus, in which the hymenium consists of plates radiating from a common centre, with shorter ones in the interior, composed of a double closely connected membrane, more or less distinct from the pileus: the veil is usually absent.

Agaricus, P. C.

Camellaria has a pileus furnished below with dichotomous, radiating, branched, subparallel folds, not separable from the flesh, sometimes anatomizing or obelose.

Merulius has the hymenium velvety, or simoon-pileata; the folds not distinct from the flesh of the pileus, bearing unequal angular or flexuous pores. [Merulius, P. C.]

Schizophyllum has the gills radiating from the base, composed of a folded membrane, which is ruptured along their edge; the two portions of the fold being revolute, bearing saci only on the outer surface.

Donkey has the hymenium composed of anatomizing gills, or flexuous elongated pores formed out of the curled substance of the pileus.

Pseudoper has the hymenium concrete, with the substance of the pileus consisting of subrouted pores with their simple discings.

Boletus has the hymenium distinct from the substance of the pileus, consisting of cylindrical separable tubes, with oblong spordia. [Boletus, P. C.]

Piptoporus has the hymenium formed of a distinct substance but concrete with the fibres of the pileus; the tubes at first wart-like, somewhat remote, closed, radiate-fimbriate, at length appearing elongated, open at the top.

Hydnum has the hymenium of the same substance as the pileus, composed of free spine-like processes.

Sistotrema has the hymenium somewhat distinct from the pileus, but composed of irregularly-disposed, curved, and gyroce lamellate teeth.

Irpes has the hymenium concrete with the substance of the pileus, torn into distinct spines, disposed in rows or in a reticulate manner, their bases connected together by lamellate sinuous, or porous folds; the saci slender, situated only on the toothed processes.

Radius has the hymenium tuberculated; the tubercles spreading, resin-bright, papillate or rude somewhat angular spines, more or less obtuse, distinct, distant or irregularly fasciculate, the inner substance homogeneous with the receptacle; the saci occupying indifferently all parts of the hymenium.

Pholas has the hymenium homogeneous and concrete, with the pileus smooth, venoso-rugose, wrinkles interrupted, disposed irregularly, straight or flexuous, bearing all over.

Thelephora has the hymenium homogeneous and concrete with the pileus, even or papillate, the whole surface bearing as.

Of these genera Agaricus contains by far the greatest number of species. On this account it has been found necessary to class the species under various subgenera. The following table contains the subgenera of Fries arranged in eight series. —

P. C. S.: No. 94.

Amanita.
Leotia.
Lepiota.
Lumina.
Tricholoma.
Crincola.
Clitocybe.

Leucocepsorus.
Leucocarpus.
Leucocarpus.
Leucocarpus.
Leucocarpus.
Leucocarpus.
Leucocarpus.
Leucocarpus.
Leucocarpus.
Leucocarpus.

Hyperodius.
Hyperodius.
Hyperodius.
Hyperodius.

Agaricus.
Agaricus.
Agaricus.
Inocybe.

Dermis.
Dermis.
Dermis.
Dermis.

Pholiot.
Pholiot.
Pholiot.
Pholiot.

Crepidot.
Crepidot.
Crepidot.
Crepidot.

Coprinus.
Coprinus.
Coprinus.
Coprinus.

Most of the species included under the series Leucocepsorus are notable, and contain those species which are mentioned as edible in the article Agaricus, P. C. It also contains the various species of Amanita, which are among the largest and most remarkable forms of the fungi. A. caesarea is remarkable for its beauty, but not so much so as for the traditional belief that it was in a dish of these mushrooms, which were regarded by the Romans as one of the greatest luxuries of the table, that Agrippina administered poison to her husband Claudius Caesar, in order to hasten her son's accession to the Imperial power. A. muscaria possesses an intoxicating or narcotic property. It is used by the inhabitants of the north-eastern parts of Asia in the same manner as wine, brandy, arrack, spruce, &c. are by other nations. One large or two small fungi is a common dose to produce a pleasing intoxication for the whole of the day.

Of all the species of the genus Agaricus have been described; of these 533 are natives of the British Islands.

Eight species of the genus Cantharellus inhabit Great Britain. The C. aurantiacus is said to be a poisonous plant. It is common in fit-woods and pastures. It has a beautiful orange colour and a strong smell. C. cibarius, the common Chanterelle, is common in woods in the summer and autumn. The pileus is of a pale yellow colour, and the whole plant has an agreeable smell like that of aspicts. On the continent of Europe this fungus is eaten, but is not often used in Great Britain. It is however dangerous when eaten raw, and should always be cooked. They form a delicious ingredient in rich gravies.

One of the species of Merulius has been supposed to be the cause of dry-rot. [Dry-Rot, P. C.; Merulius, P. C.] Berkeley describes five species of this genus as natives of Great Britain.

Of Schizophyllum but one species has been found in Great Britain, the S. commune. It is a very beautiful fungus, and has been found in almost every part of the world.

This genus Dendron has been so named from the remarkable sinuosities and sculpture-like pores of its hymenium. D. quercina is found commonly on oak-trees or stumps and stumps of that wood, it is a straggling and has been applied to wounds to arrest hemorrhage. It is commonly called the 'lungs of the oak,' and was formerly on this account used as a remedy in phthisis. It is at the present day sold in Covent Garden market for that purpose. There are other species of this genus which are indigenous in Great Britain.
**D. nivoseus** is a northern plant. It yields an agreeable perfume.

Upwards of forty species of the genus *Polyergus* are found in Great Britain, and many more European species have been described. Many of the species are used in arts and medicin(e). *P. ignarius* has long been famed as a styptic. Amadou, or German tinder, is made from this plant by separating the porous hymenium from the harder parts and steeping it in a solution of nitre after it has been beaten into a soft, spongy state. Many other species of *Polyergus* may be used for the same purpose. The Laplanders also use them for applying to actual cauteries in the same way as the Japanese and Chinese use the smoke of sandalwood. When the teeth are sore in the limbs, they pull the fungus in pieces and placing it on the skin, set fire to it and allow it to burn away till it blister; thus, as it is a counter-irritant, *P. officinalis* is a cathartic. *P. suaveolens* has a pleasant smell. Some of the species secrete acids, and boletic, fungic, and oxalic acids have been obtained from them. *P. squamosus* is one of the largest of British fungi, weighing sometimes as much as thirty pounds. *P. destructus* is one of the fungi found on decaying timber when it is attacked with what is called dry-rot.

Many of the plants formerly included under the genus *Boletus* are now referred to *Polyporus*. Berkeley enumerated sixteen species of the genus *Boletus* as natives of Great Britain. [*Boletus*, P. C. T.]

The genus *Hydnellum*, although named after *Stropharia*, the true boletus of the Pacific coast, is a series of plants. The hymenium is formed of spores which give to the species of this genus a very formidable appearance. Hence they are called in the country of the spine stalks, prickle-stools, &c. Several species are found in Great Britain, but some caution should be used in their selection. De Candolle says that those which have a dark colour are dangerous.

The genus * Fistulinus* has one representative in Great Britain, *Fistulina hepatica*. The pipe-stem of the forest. It grows upon the trunks of oaks and other trees. It is eaten in France. When cut into it is beautifully marbleied with red and white streaks resembling a fine piece of beef. It is called in France *Pêse de Chasse*, or *Chasseur de Bois*, Glout de Chasse. It is as an astringent taste, but is rather tough. It has been known sometimes to attain the weight of thirty pounds.

The genus *Stictotrema*, *Trepis*, *Radulium*, and *Philbia* are small genera, and not used as food, or in any way. *Thelephora* is an extensive genus, and forty-two species are indigenous in Great Britain. They are common on decaying branches of trees, &c., and exhibit a variety of colours.

The tribe *Clomatiaceae*, which are distinguished by a single or branched vertical receptacle, embrace the following British genera: — *Clavaria*, *Cenocoma*, *Geoglossus*, *Spalthularia*, *Mictrea*, *Typhula*, and *Phallaria*. These plants, in their trunks and club-shaped forms, begin in the soft wood, and are actually placed by the older naturalists in the same class. Some of the species of the *Clomatiaceae* are edible. All the genera as a class, are of a good, very strong, fibrous, and agreeable flavour like that of the common mushroom. *C. flavida* and *C. pygida* are prized on account of their taste. *C. cinerea* is the species most commonly eaten on the Continent.

The *Mitrula* have a bulbus, fimbriate, margined receptacle. They embrace five British genera: *Morchella*, *Helcogala*, *Vasco*, *Leotia*, and *Vibrissa*. The genus *Morchella* yields the esculent fungus morel. [*Morchella*, P. C. T. These species are found in Great Britain. There are also three British species of Helvelia as that genus is at present defined. The species of Helvelia are edible.

*H. crispata* is considered the best species for eating, but none of the British or French, are poisonous.

The tribe *Cupulatae*, which has a patelliform margined receptacle with a superior hymenium, contains the following British genera: — *Pestia*, *Patulatia*, *Asclepia*, *Bolbus*, *Dianella*, *Senecio*, *Sticthelis*. Of these *Pestia* is the most extensive genus, containing upwards of 300 species, of which 106 are natives of Great Britain. Some of these plants are very remarkable from the form of the spores, as they are smaller than the spores of any other plant. *P. coccinea* is perhaps the most elegant plant belonging to the natural order of Fungi. The outer surface of the cup which it forms is white and downy, whilst the inside is of a deep purple. It frequently grows on stichs, and is mixed with moss, the green colour of which forms a beautiful contrast with the white and crimson of the Pestia. *P. arvigozus* has a deep green colour, and possesses the property of staining wool on which it grows of the same colour as itself.

The *Pezizaceae* are not generally eaten, but none of them are poisonous.

The fifth and sixth tribes of the Hymenomycetæ are the *Tremellini* and *Sclerotiniaceae*. The *Tremellini* embrace six British genera. The *Sclerotiniaceae* are included under *Sclerotium* and *Cytosporaceae*. These are amongst the lowest forms of the Hymenomycetæ, and include species which are found decaying the various vegetable products producing the disease called ergot. [*Ergot*, P. C. S.; *Spermophila*, P. C. E. A. C.]*

Ex. The remaining forms of the Fungi are given under *Gasteromycetaceae*, P. C. S.

[Burnes, _Gastromycetes_, _English Flora_, vol. v.; Fries, _Systema Mycologicum_.]

**HYNDFORD, JOHN CARMICHAEL, third EARL OF A SCOTTISH PEER.**

The representation of one of the Sixteen Peers, the Scottish nobility in several parliaments, acted for two successive years (1739, 1740) as royal Commissioner to the General Assembly of the Church of Scotland, and held the dignity of lord lieutenant of the county of Lanark, in the upper district of which the family estates were situated. His diplomatic life began upon the occasion of the seizure of Silesia by Frederick the Great in 1741, when his lordship was deputed envoy extraordinary and plenipotentiary to the Prussian court. In this mission he succeeded in effecting an accommodation between the imperial representative and the Empress-Queen Maria Theresa, by a treaty concluded the following year at Breslau. So sensible were the contracting parties of the value of his lordship's mediation and services, that by a grant from the King of Prussia and the Empress-Queen, he was permitted to assume, in addition to the family armourial bearings, the Silesian eagle, with the motto 'ex bene merito,' and was moreover honoured by his own king with the additional dignity of the order of the Thistle. At Berlin he became acquainted, through the introduction of Frederick, with the famous Baron Trenck, who gratefully acknowledges in his Memoir, the 'paramount trouble' in which he was placed, and who, through his influence, procured for the young diplomat his interest with the Imperial court. In 1744 Lord Hyndford was sent ambassador to Russia, where he became a great favourite of the Empress Elizabeth, who took an active part in behalf of Maria Theresa; and he was highly instrumental in bringing about, in 1748, the peace of Aix-la-Chapelle, which terminated what is known in history as the war of the Austrian Succession. In this mission his lordship continued till the end of 1749, and on his return was constituted a privy councillor and lord of the bed-chamber. In 1752 he was sent to the Court of Vienna on his third embassy, which was accompanied by a new treaty which terminated, though he did not altogether withdraw from political life. In 1764 he received a further mark of the king's esteem in the appointment of lord vice-admiral of the northern waters of Scotland. Hyndford's sisters are divided between London and the family seat at Carmichael, in the vicinity of which the memory of the 'Ambassador' is still cherished with almost filial regard by the descendants of those who benefited by the munificence of his lordship, which he never ceased to manifest in promoting the interests of his county. During his whole lifetime, and particularly his latter years, his attention was unremittingly devoted to his estates, which he enhanced in value by extensive improvements, and enlarged by judicious purchases and advantageous exchanges. He died in 1767, leaving no issue. His official correspondence, extending to twenty-three volumes in manuscript, in the British Museum, to which it was secured by purchase in 1838.

**HYPANTHOCRINUS, a genus of fossil Crinoids, from the Silurian strata.**

**HYPANTHOCRINUS.**

The conditions under which the equation of the second degree belongs to an hyperboloid are given in *Surfaces of the Second Degree*, P. C. Of the two kinds of hyperboloids there mentioned, one, the single hyperboloid, is represented by the equation in which the signs of the two squares can be drawn upon it. Through every point of the surface two straight lines can be drawn, which are entirely upon the surface, and which are also in its tangent plane. When the surface is a circular hyperboloid, and the revolution of an hyperbola about its minor axis, these straight lines are all divided into two sets, each consisting of lines symmetrically disposed with respect to the axis, but never meeting it: so that if one of either set were to revolve
about the axis, it would describe the surface. Consequently a straight line revolving about an axis which is not in its plane, describes a single hyperboloid of revolution. This surface is therefore easily turned: the outside of a dice-box is an example. Latinly HYPERCYCLICUS, a genus of plants belonging to the natural order Hypericae. The calyx is 5-parted, or it has 5 sepals; 5 petals; 5 stamens, and a 3-celled capsule. The flowers of the species are mostly yellow. There are 13 British species of this genus, and 172 are enumerated by Don as growing in various parts of the world: St John's Wort is the common name of all the species.

Hypertrochium has an erect quadrangular stem, elliptical ovate oblong leaves, with a few pubellous dots, reflexed ovate lanceolate sepals having pilose streaks. Ovate petals, with purple streaks and dots beneath. It is the H. quadrangularis of the Flora, which is the type of the genus.

H. perforatum has an erect 2-edged stem, ovate or elliptical leaves with numerous pubellous dots, anthers with black dots, the styles as long as the calyx. It is found in large quantities in Britain and throughout Europe; also in the north of Asia and Africa. The flowers are of a bright yellow colour, dotted and streaked with purple; when rubbed they emit a powerful lemon-like scent and stain the fingers with dark purple. The whole of the plant contains a powerful volatile oil, which is aromatic and possibly astrigent, though as yet it has been but little used in medicine. Its sensible qualities being low, it was not long before it was found to be efficacious, entitle its virtues to a further trial. When boiled with alum this plant yields a yellow dye which is used for colouring wool. The common people of Germany and France gather this species on St John's Wotl with great ceremony on St John's day, and hang it in the windows and about their houses as a charm against evil spirits, storms, thunder, and all other calamities, mistaking the meaning of some medical writers who falsely called the plant Febrifugium, and not a notion that it was a remedy in manical disorders. At one time the people of Scotland used to carry it about their persons as a protection against witchcraft and enchantment, and thry fancy it prevents rpy milk by milking up the whole herb.

Cows and goats will eat the plant, but horses and sheep refuse it. It is the Aegopodium of Dioscorides (ii. 102). It is found at the present day on the high hills of Attica.

H. laxiculmis has a smooth herbaceous stem, rather distant oblong leaves, full of pubellous dots; the lower leaves narrow and lanceolate, segments of the calyx equal, nearly linear and acute. It is a native of Brazil, in the provinces of St. Paul and Minas Geraes, where a decoction of the leaves is used as a remedy against the bites of serpents.

H. crispa is a round branched stem, sessile lanceolate leaves, with yellow-brown stipules. The word is derived from the Greek -krispein, to cut, therefore it is called the cutting blinks. It is native in the regions of the Mediterranean, and is the iphaea of Hippocrates (Mor. Bub. i. 610); also of Dioscorides (ii. 161), and the Hypericum 'quod alii chamaperon' (Green). It is a species of St John's Wotl with great ceremony (De Plant. ii. 4. 2).

At the present day it grows near the sea in Attica.

H. perfoliatum, the iphaea of Dioscorides (ii. 163). It has a 2-edged stem; ovate, clasping, dotted leaves; fringed and dotted sepals and petals, and sessile flowers. It is a native of Italy.

H. Cordius has a shrubbery erect round stem, linear leaves in whorls with revolute margins, and a blunted linear calyx. It is the iphaea of Dioscorides (ii. 174), and the Cordia of Pliny (xxvi. 3). This species is a pretty little shrub, native of the Levant, and in dry places in the south of Europe.

H. tigridium is distinguished by its ascending downy stem, ovate blunt and pubescent leaves full of pubellous dots, numerous stamens, and many black dots in the corolla. It is a native of the East, about Constantinople, Thrace, and Armenia, and is frequently found on high mountains in company with H. perfoliatum. It is probably the iphaea of Dioscorides (iv. 6), and undoubtedly the Ageratum of Pliny Cordius.

H. Olympicum has elliptical lanceolate leaves full of pubellous dots; a round stem, and withering corolla and stamens. It is a native of Mount Olympus and of China. Fraas thinks it is the iphaea of Dioscorides.

Most of the species of Hypericum are showy, and deserve cultivation. The hardy herbaceous kinds will thrive in any common garden soil, and are easily propagated by dividing the roots in autumn. The golden pansies and frillike borders of the greenhouse of France will thrive best in a mixture of loam and peat and strike root readily in sand under a box.

Hypochras, a genus of plants belonging to the natural order Compositae, to the suborder Cichoroae, and to the section Lactuceae, which has yellow flowers and a brown fruit. Hypochras may be used in medicine as an astringent.

Hypodun. (Fishes, Fossil, P. C. S.)

Hypotirous Acid was discovered by Gay Lussac, who obtained it by adding nitric oxide gas in excess of oxygen gas, confined in a glass tube over mercury, containing a concentrated solution of potash; under these circumstances 50 volumes of oxygen gas unite with 200 volumes of nitric oxide gas, which forming hypotirous acid unite with alkali. This acid may also be obtained by long exposure of nitric oxide gas to solution of potash, or by exposing to intense cold a mixture of 50 volumes of oxygen gas with 200 volumes of nitric oxide gas. By this operation the acid is obtained in a liquid state and possesses the following properties:

At common temperatures it is green, but at 0° it is colourless; it is very volatile, so that when exposed to the air, it is rapidly converted into nitrous oxide which is stated to be 172, air being 1. When water is added, the acid is decomposed and converted into nitric acid and nitrous oxide, the latter escaping with effervescence. It is composed of

Three equivalents of Oxygen = 24
One equivalent of Azote = 14

Equivalent . 38

This acid does not combine directly with bases to form salts, being on its admixture converted into nitric acid and nitrous oxide. Hypotirities may however be formed by moderately heating certain nitrates, the acid of which losing two equivalents of oxygen, hypotirous acid remains, and in combination with the base. Hypotirities of lead may be formed by boiling metallic lead in a solution of the nitrate of that metal. Hypothec (from the Greek ipheco, a security, literally the subjection of a thing to the authority of another person) is a term derived from the civil law, still in use in the law of Scotland, and in that of France, with the literal variation hypothec; while, though in the law of England it is not received technical expression, it is occasionally used for describing any species of security holding the character which the French have attached to it. Hypothec and hypothecation have in their proper acceptation signified a right of security over something which was not placed in the creditor's possession, in contradistinction to pignora, which is now termed a pledge. This distinction properly clearly drawn in book iv. c. 6 of the Institute, and in the Pandects, xii., tit. 7, a 9, De Pignorat. Act. vel contr. Proprie pignora dicimus, quod ad creditoris trueta hypothecas, non passio possidet ad creditorum. But the distinction is often lost sight of, even in the original authorities of the civil law.

See Bracianus de Verborum Significatibns, fol. Hypothecas were distinguished into those created by contract, and the tacit or prastorian, admitted in certain circumstances without stipulation. The law on the subject will be found in the Pandects, lib. xii, tit. vii. De Pignoratia Actione, 5c. (above referred to), and in lib. de Pignoribus et Hypothecis.

The several securities over real property in various parts of the empire, which can be completed without the absolute transfer of the property to the creditor, are so many illustrations of consensual hypothec in description of property.

Conensual hypothec in moveables are nearly unknown in the British Empire, as the law, studying the interests of commerce, has discouraged this latest right, and, individual over merchandise and other movable goods while they are left apparently at the disposal of the original owner, and are liable to be viewed by all who transact with him as property. Bottomry and Receptantia are not examples in which it is countenanced. But there are still some tacit hypothec created by the operation of law, affording a preference to particular creditors over the property of a person who cannot or will not sell his lands. In this sense, hypothec is properly the counterpart of lien, the former being a tacit security over property which is in the debtor's
bands, the latter property over in the creditor's hands. Those provisions in the excise laws which give the revenue a preference over excisable commodities, and the instruments used in the manufacturing, are strictly the creation of tacit hypotheses. The provisions in the bankrupt acts for paying servants' wages and other debts out of the residuum funds of the bankrupt are the establishment of a general hypothesis over the estates.

In Scotland the landlord's privilege to seize the tenant's goods for arrears of rent is called a hypothec while it is unexercised—that is to say, before execution against them is commenced. This is a privilege which, if exercised, is a common form of hypothec over the goods. On an agricultural farm the crops stand hypothecated for the rent of the year of which it is the produce. The landlord's right exists so long as the crop is on the farm, and it extends to the reversion of it even from a bona fide purchaser within three months after the rent has fallen due, unless he has been a purchaser by bulk in open market. The hypothec includes for other effects—as the cattle on a farm, the tenant's furniture in a house—substitutes over the whole for each term's rent, and gives a preference for three months after the rent is due. The landlord's hypothec is not affected by the bankrupt statutes. Another right of a different description is called a hypothec in Scotland—viz., the right of a law agent to take his client's decree for expenses, or judgment for costs, in his own name, in order that he may recover payment of his account as aforesaid by the auditor of court. This right cannot be defeated by a collusive settlement. In Scotland a law agent, whether employed to conduct a litigation or in other professional business, such as conveyancing, is entitled to retain his employer's title-deeds and papers until his just account is paid. This right has also been called a hypothec, but it is clearly a lien.

In France there is a distinction between privileges and hypotheces. All tacit hypotheces, according to the division above laid in view, are included under the former, which are subdivided into a general preference over all the moveables or personal property in the debtor's possession, and limited preferences over particular articles of property for particular obligations. This last named, in so far as it affects moveable property, is the class of rights which has been spoken of above as tacit hypothec, and it includes the landlord's security for his rent. It is also a class of privileges on les immeubles, consisting of tacit preference over immovable and landed property, and is the object of much useful legislation, such securities being, from the efforts to give virtual effect to the law for partition of Successions, without reducing them below the proper extent for agricultural operations, more common in France than perhaps in any other part of the world. See on the matter of the immediately preceding remarks, Code Civil, lib. iii. tit. 18.

HYPOTHETICATION. [Montroge, P.C.]

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ICE-HOUSE, a building constructed for the purpose of keeping ice through the summer, by excluding, as perfectly as possible, the influence of changes in the temperature or humidity of the external atmosphere. Such structures are not only useful for preserving ice which is to be applied to the cooling of liquors, or to the preparation of articles of confectionary, but also as affording the most effectual means known for keeping meat, fish, game, vegetables, and fruit sweet and fresh in hot weather. In Loudon's 'Encyclopedia of Cottage, Farm, and Villa Architecture,' where (p. 736-739) a detailed account is given of various modes of constructing ice-houses, it is observed that although these important conveniences are rarely to be found among the buildings of an English farm, they are becoming of more and more common in North America, and might be advantageously introduced in this country, especially upon such farms as are connected with inns. To a gentleman's country residence an ice-house is always an important, and, in some cases, almost an indispensable appointment.

One of the simplest modes of preserving ice, alluded to in the work above mentioned, consists in enveloping the ice in a great quantity of straw, above the surface of the ground, in such a position that moisture, which is even more injurious than heat, may drain off freely. For this purpose the ground should be raised in the form of a flattened cone, upon which should be laid a stratum of straw-covered bags, the agents to the thickness of a foot or more, and the ice is piled upon it in a compact conical mass, the larger the better. Over the ice is laid first a foot of thickness of straw, then baggo-wood to a further thickness of two feet, the interstices of which have the effect of keeping a stratum of confined air round about the pile of ice; and finally two or three feet of straw arranged as a mat. The best situation for such an ice-stack or mound is stated by Loudon to be under the shade of trees, or, where such shelter cannot be obtained, under a kind of shed roof, with an opening to the north only. Some writers, however, among whom may be mentioned Cobbold, who notices the subject in his 'Cottage Economy,' considers that, in consequence of their tendency to increase the humidity of the air, the vicinity of trees is objectionable. On the same principle some recommendation is made in North Americaners, in preference to a northern aspect, for the entrance to an ice-house, in order that the morning sun may dissipate the damp air from it.

An underground ice-house may, according to Loudon, be simply a large cellar, with hollow or double walls, floor, roof, and doors, and furnished with a trapped drain to allow the escape of such water as may be produced by a partial thaw, without admitting any air. Such ice-houses are usually formed in the shape of a hollow square, of which the advantage is, that the ice is kept more compactly together than any other form, because, in case of any thaw taking place, the remaining ice will naturally slip down, so as to fill in the hollow, and thus preserve its shape. Loudon does not conceive sufficient to compensate for the greatly increased expense of construction involved in the adoption of the conical form. A plain square room, he observes, with double side walls, a step apartment, a double arch over, and a double floor under, which can be built with the same ease as any common cellar, will, all other circumstances being alike favourable, keep the ice as long as any conical form whatsoever. In all cases it is well to interpose a layer of straw, reeds, or chaff, which is preferred to straw in Italy, where it is used for packing ice for travelling, between the walls and the ice; and by the use of faggots as well as straw any perfectly dry cellar in a suitable situation may be used as an ice-house. In some situations a sufficient degree of hollowness in the walls may be produced by the adoption of the plan of building with bricks or stones placed under Bellows, P. 250, or by some other contrivance. One mode of building hollow walls which may be thus applied, consists in the use of half-bricks, divided longitudinally, as stretchers, leaving a space of an inch or more. Such solid bricks or half-bricks are easily produced by nearly cutting the brick in half with a wire before burning, when, after paying duty only as a single brick, it may, when burnt, be easily broken in two. Hollow boxes for ice (houses under Bellows, P. 250), or by some similar contrivance. One mode of building hollow walls which may be thus applied, consists in the use of half-bricks, divided longitudinally, as stretchers, leaving a space of an inch or more. Such solid bricks or half-bricks are easily produced by nearly cutting the brick in half with a wire before burning, when, after paying duty only as a single brick, it may, when burnt, be easily broken in two. Hollow boxes for ice (houses under Bellows, P. 250), or by some similar contrivance. One mode of building hollow walls which may be thus applied, consists in the use of half-bricks, divided longitudinally, as stretchers, leaving a space of an inch or more. Such solid bricks or half-bricks are easily produced by nearly cutting the brick in half with a wire before burning, when, after paying duty only as a single brick, it may, when burnt, be easily broken in two. Hollow boxes for ice (houses under Bellows, P. 250), or by some similar contrivance. One mode of building hollow walls which may be thus applied, consists in the use of half-bricks, divided longitudinally, as stretchers, leaving a space of an inch or more. Such solid bricks or half-bricks are easily produced by nearly cutting the brick in half with a wire before burning, when, after paying duty only as a single brick, it may, when burnt, be easily broken in two. Hollow boxes for ice (houses under Bellows, P. 250), or by some similar contrivance. One mode of building hollow walls which may be thus applied, consists in the use of half-bricks, divided longitudinally, as stretchers, leaving a space of an inch or more. Such solid bricks or half-bricks are easily produced by nearly cutting the brick in half with a wire before burning, when, after paying duty only as a single brick, it may, when burnt, be easily broken in two. Hollow boxes for ice (houses under Bellows, P. 250), or by some similar contrivance. One mode of building hollow walls which may be thus applied, consists in the use of half-bricks, divided longitudinally, as stretchers, leaving a space of an inch or more. Such solid bricks or half-bricks are easily produced by nearly cutting the brick in half with a wire before burning, when, after paying duty only as a single brick, it may, when burnt, be easily broken in two. Hollow boxes for ice (houses under Bellows, P. 250), or by some similar contrivance.
similar method is pursued in Portugal, where, when the snow has been collected in a deep gulf, some grass or green soda, covered with dung from the sheep-pens, is thrown over it; and soLB the snow is preserved that it may be taken up and transported to a considerable distance throughout the summer.

In connection with the subject of this article, Loudon describes a kind of pantry intended to serve some of the purposes of an ice-house, in which the evaporation of water, constantly trickling down the outside of a close conical chamber, fixed in the ground, is employed as a means of refrigeration; and also, in section 2596 of his 'First Additions to 'Ice-Box,' an ice-box which might almost be termed a portable ice-house. It consists of an inner and outer apartment, the latter being filled with burnt cork reduced to powder, this being found to possess higher non-conducting properties than the charcoal of wood. The lid is double, and is filled with the same substance; and it is made perfectly tight by means of projecting ledges, which, when shut, dip into a gutter filled with water. Ice may be preserved for several weeks in such a box, in which also bottles, dishes, &c. may be placed. Similar to this contrivance is the American ice-safe lately introduced into this country.

ICE-PLANT. [Mesembryanthemum. P. C.]

ICHNEUMON, a genus of insects belonging to the order Hymenoptera, and family Pididae, or Ichneumonidae, in the arrangement of Latreille. The genus, as defined by Linnaeus, included such pappophorous hymenoptera as are furnished with veined wings (the anterior pair present or in the female, often or sometimes) a pair of short or setaceous vibratile antennae composed of a great number of articulations, and an ovipositor of various length and complicated structure. The Linnaean genus now constitutes a group including a great many well-marked genera and an immense assemblage of species. All these are remarkable for the habits of their larvæ, which are parasitic in the bodies of other insects. These bodies the perfect ichneumons perforate by means of their ovipositors, and there lay their eggs. This destructive habit gave rise to the name by which they are known; a comparison being drawn between them and the Egyptian ichneumon (Vespa Ichneumon), the quadruped celebrated as the destroyer of serpents and crocodiles.

The history of these insects has attracted much attention among naturalists, and many elaborate memoirs have been written upon them. The purpose they serve in the economy of nature has been well described by Kirby and Spence: 'The great body of the ichneumon tribe is employed in keeping within their proper limits the infinite host of lepidopterous larvæ and destroying, however, many insects of other orders. Such is the activity and address of the Ichneumonidae that scarcely any concealment, except perhaps the waters, can secure their prey from them; and neither bulk, concealment, nor the power of tarrying upon the wing, has prevented them from effecting their purpose. They attack the ruthless spider in his toils; they discover the retreat of the little bee, that for safety bears into timber, and, though its enemy ichneumon cannot enter its cell, the long ovipositor she reaches the helpless grub, which its parent vainly thought secured from every foe, and deposits in it an egg which produces a larvæ that destroys it. In vain does the destructive Cecidomia of the wheat conceal its larvæ within the glumes that so closely cover the grain; three species of these minute benefactors of our race, sent in mercy by Heaven, know how to introduce their eggs into them, thus preventing the mischief they would otherwise occasion, and saving mankind from the horrors of famine. In vain also the Cymips, by its magic touch, produces the curious excrescences on various trees and plants, called galls, for the nutriment and defence of its progeny; the gall wasp is a great enchanter to its destined inmates, pierces its wall, however thick, and commits the destroying egg to its offspring. Even the clover weevil is not safe within the legumen of that plant; nor the wireworm in the earth from which it takes its nourishment. (Introduction to Entomology, vol. i. p. 267.) In the third volume of the Transactions of the Linnean Society, in a Memoir by Mr. Marsham, may be found an account of the operations of one of these insects, the Pimpla rufa, observed by him in Kew Gardens. The details of its proceedings there given are exceedingly interesting, and present a remarkable picture of the mode in which the larvæ of ichneumons are in some cases solitary, in others gregarious. The members of a company quit the bodies of their victims and spin a cocoon of silk before being transformed into the chrysalis state. Those of others remain and use the skin of the caterpillar as a covering. By a wonderful instinct, when the grub leaves the egg, instead of letting the caterpillar remain within whose body it has hatched, and thereby destroying its food, it confines itself to the fatty part until it has nearly attained its full size.'

ICHNOCARPUS (from ἱχνος, a 'footstep,' vestige, and καρπος, a 'fruit,' in reference to the slender follicles), a genus of plants belonging to the natural order Apocynaceae. It has a white or silver-colored and fragrant, long lancolate leaves tapering to both ends, axillary peduncles very long and racemosi. It is a native of Ceylon and Nepal. The flowers are small and purple; the leaves deep green above and pale beneath. According to Professor Boyle, it is sometimes used in India as a substitute for sarvaparilla, and it is also mentioned by Aelianus in his Renedia Quinennia as a medicinal plant.

I. schmutteringi has oblong lancolate leaves tapering to both ends, and axillary trichotomous spreading peduncles. It is a native of Nepal, and has large handsome flowers.

I. fastuolus is a gibbous shrub with turning stems, oval acute leaves, small flowers, and fruit, from Tibet, on the banks of the Indus. The corolla is white and sweet-scented. It is a native of Sierra Leone, and about the river Bascha, in woods and among bushes.

I. Lanzonii is a fuscous stem, ovate oblong leaves, lateral 3-flowered peduncles. It is a native of Zanzibar. All the species of Ichnocarpus grow well in a mixture of loam, peat, and sand, and cuttings strike readily in sand under a hand-light.

(Don. Gardener's Dict.; Lindley, Flora Medica.)

ICHTHYOLOGY, RECENT ADDITIONS TO. The researches of naturalists in all parts of the world have of late years greatly added to our knowledge of fishes, and revived the interest attached to this important branch of vertebrate Zoology.

The connection which the genius and labours of Agassiz have established between Ichthyology and Geology, little tended to promote research in this direction, and the results are beginning to hold no unimportant place in natural-history publications. Moreover, now that philosophic Zoology is fast gaining ground, and mastering the species-making and mere collecting, which had so long taken the name and usurped the place of the science, the study of a class of animals including the links between the vertebrata and invertebrata, is assuming a degree of importance to which it formerly could lay no claim. On the much-neglected subject of the classification and the distribution of fishes, some important researches have been recently made known, of which, as they will probably receive no great progress of Ichthyology, we shall here give a brief summary.

Classification of Fishes. — The natural arrangement of fishes has recently engaged the attention of two of the most eminent and philosophical naturalists of our time, W. S. MacClay and J. Muller. Mr. MacClay's views on this subject are made known in a letter to an eminent Indian naturalist, Mr. M'Cleld and were published in the Calcutta Journal of Natural History for July, 1841. Throughout they are influenced by the quinarian hypothesis, of which he is the distinguished author. He bases his classification on three generally admitted facts, which he holds to be incontestable. The first is the near approach of fishes to Benthonic Amphibia, which, with Swainson, he considers to be made by means of Lepidos and Moltha. 2nd. The near approach of fishes to the Cetaceous Mammalia, the viviparous sharks constituting the connecting link between the two. 3rd. The fact that it is their being the most imperfect of vertebrata, the most typical of fishes ought therefore to be the most imperfect of them, i.e. the furthest removed from the type of vertebrata, a position in which many naturalists still believe them to hold. He regards as examples of such fishes the Cyclostome. Bearing the above 'fundamental facts' in mind, he constitutes the following primary divisions:

Abdominal Branchiostegalia. branchiostegalia. Gills pectinated.

1. Plagiostomi. Cartilaginous fishes with fixed branchiae, leading to Mammalia.


3. Bony fishes with free branchiae, leading to Amphibia.
Normal group. Actinopterygii. Fish breathing with gills, not lungs.

4. Lophobranchii. Bony fishes breathing by tufts arranged in pairs along the branchial arches.

5. Cyclostomi. Cartilaginous fishes breathing by a bony or cartilaginous gill.

Mr. Melday has not yet presented an analysis of the families and genera included under the above five orders, with the exception of those of the third, Osteropterygii, a term by which he proposes to designate the osseous fishes having pectoral fins. The following table of his subdivisions of this important order will convey to the naturalist a clear idea of his system.

Osteropterygii.


Tribe 1. Balistidae. Maxillary bones soldered to the internal maxillaries, and both to the palatine arch; opercula and gills concealed beneath the skin. Includes the families Balistidae, Ostraciidae, Cephalaspiidae, Orthosomatidae, Diocotidae.


Tribe 4. Pleuronectidae. Ventral fins, when existing, inserted under the pectorals, and directly suspended to the bones of the shoulder. Anguidae, Echeneidae, Cyclopteridae, Pleuronectidae, Gobiidae.

Tribe 5. Abdominidae. Ventral suspensions behind the pectorals, and not attached to the bones of the shoulders. Siluridae, Cyprinidae, Esoxidae, Cuspidae, Salmonidae.

Geographical Distribution of Fishes.—This branch of ichthyology is beginning to attract the attention and research which the interest of the subject demands. Within the last five years the example of Yarrell has been followed in many countries, and valuable local monographs published, with excellent illustrations. In the north of Europe, besides the writings of Pison and Eckern, the fishes of Denmark are in progress of illustration by Henrik Kroeyer. Those of Belgium have been carefully examined by M. de Selys Longchamps. In that naturalist's Fauna Belgica fifty-three fresh water species have been enumerated, and the list is expected to be extended. Of the forty, forty-three live only in fresh water; six in fresh water, but go to the mouths of rivers in winter, and may be driven out by the rivers in spring or summer. Of the sea-fishes thirty pass up the Scheldt as far as Antwerp. The fresh-water fishes of central Europe are engaging the attention of Agassiz, and his work on them is in progress of publication. Freyer has published an account of those inhabiting Carniola, amounting to thirty-two species. Italian ichthyology has been admirably illustrated by Charles Bonaparte, the Prince of Canino. In Asia the fishes of the Caspian have been described by Eichwald in his Fauna Caspica-Caucasica, published in 1841. Those inhabiting the rivers of Syria have been enumerated by Heckel (1843) from the collections of Koch. Fifty-seven species inhabit the rivers of Orange and Euphrates, of which not fewer than forty-five are Cyprinidae. Indian ichthyology has received valuable contributions from Mr. Clelland, whose papers have been chiefly published in the Calcutta Journal. In Siebold's Fauna Japanica (1842) there are accounts and figures of Japanese fishes by Temminck and Schlegel. The most valuable contribution ever made to our knowledge of the ichthyology of Eastern Asia was communicated to the British Association at Cambridge in 1842, in the form of a report on the 'Ichthyology of China,' by Dr. Richardson. From his researches it appears that the fishes of that region are not only very numerous, but vary in manner very markedly from land to land, and on account of the extensive fisheries there carried on. His remarks on their distribution are highly interesting. It would appear that chains of islands or coasts having an east and west extension determine the extent of the range of species and groups of species. For example, to take the intertropical zone of the ocean, we find a vast number of fishes common to the Red Sea, the coasts of Madagascar, the Mauritius, the Indian Ocean, the south of China, the Philippines, the Malay Archipelago, the northern coast of Australia, and the whole extent of Polynesia including the Sandwich Islands. In regard to the generic forms of the fresh-water fishes, China agrees with the peninsula of India. Were the vast zone in question, embracing more than two-thirds of the circumference of the globe, to be subject to glaciation, we should find the remains of fishes similar everywhere throughout, the species which have a local distribution being few and unimportant.

This result of Dr. Richardson's researches is of the highest importance when brought to bear on geological considerations. Dr. Richardson has also been engaged in the special investigation of the ichthyology of Australia, and his many valuable memoirs on that subject may be consulted in the Transactions of the Zoological Society, and in the Annals of Natural History.

In Diefenbach's Travels in New Zealand (1843), the same indefatigable and philosophic zoologist has published, in conjunction with Mr. Gray, a list of the fishes of New Zealand. Ninety-two species are there enumerated. In Smith's Illustrations of the Zoology of South Africa, figures and descriptions are given of the fishes of the Cape of Good Hope. The researches of Professor P. Peters on the fishes of Madeira (Zeological Transactions and Proceedings).

The labours of Jenyns on the fishes collected during Captain Fitzroy's voyage have contributed much to our knowledge of the ichthyology of the southern extremity of South America, whilst that of Guiana has been illustrated by Sir Robert Schomburgk, in the Naturalist's Library. De Kay's Zoology of New York (1842) has made us acquainted in detail with the fishes of the United States. They amount, so far as known, to 440 species, distributed through 166 genera and 32 families. In the State of New York there are 126 Acanthopterygii, 15 Malacopterygii, 18 Pleurostomi, 3 species of sturgeon, and 27 cartilaginous fishes. It is to be regretted that the researches of Dr. Parran on the West Indian fishes are still unpublished, since they would go a long way towards enabling us to gain a connected view of the ichthyology of the new world.

As far as we can judge from the materials as yet collected, the distribution of fishes appears to be determined by the same laws which regulate that of other aquatic animals. Climate, composition of the element in which they live (whether salt, brackish, or fresh), and conformation of the sea or river bed, on which the depth of water depends, are the great regulating influences. The distribution of certain species of fishes is confined to certain areas, and no attempt has been made to conduct it in deep water, whilst others can only be maintained among shallows, shows the influence of depth; the fact pointed out by Dr. Richardson that the sea, by ranges of land or reefs, is divided for great distances, and that the climatal parallel, are peopled by the same species of fishes, is an instance of the action of the combined influences of climate and depth. The distinctness as to genera and species of the greater number of river and lake fishes from those inhabiting the sea depends on the second of the three great influences enumerated—that of the composition of the element in which they live. Great depths cut off the range of species even when climatal conditions are similar. The fishes of the coast of the United States are for the most part distinct from those on our own side of the Atlantic. Some fishes have very limited ranges in depth compared with others, and, generally speaking, it may be assumed that those having the greatest vertical range (i.e., range in depth) have also the widest horizontal extension, a fact depending on the capacity of such species for living under a greater variety of conditions. Barriers of land, as chains of mountains, determining the courses of rivers, are often the boundaries between two distinct species of fresh-water fish, and in like manner barriers of land may separate two very distinct marine genera. The distribution of marine vegetables, affecting the distribution of numerous marine invertebrata which feed on those vegetables, and in their turn serve to furnish food for fishes, will materially affect the distribution.
of many species of the latter. So also will the presence of currents, and even the agency of man, assist often unintentionally in the conveyance of ova from one country to another. Distant regions, presenting similar conditions, such as the Norwegian Arctic Sea, are inhabited by species closely related but not identical, and presenting a general aspect very similar, depending on characters of form and colour, &c. It is probable also that the fishes inhabiting the greater depths of the tropical seas resemble each other more closely than those of temperate climates, and that those of the latter in like manner approach Arctic forms.

A brief glance at the range and distribution of the principal genera of fishes will illustrate the positions.

The lowest and most anomalous of all the species of fishes, the Branchiostoma, is generally distributed through the seas of Europe. Only one species is known, yet we cannot but hope that the researches of the many active naturalists now occupied with the study of marine zoology will bring to light new forms connecting the Lancelet with other genera. The Myxinoe, or glutinous hag, almost exactly square in form and structure, is confined to the most northern and most southern seas, and is replaced in the higher parts of the southern hemisphere by the equally curious and nearly allied genus Hepsetusmiss.

The lampreys inhabit the fresh waters of Europe and America, but the same species is found in each. The Lepadid, Lepadis, the connecting link between fishes and reptiles, so curious in organization that it is still disputed whether it is a fish or a reptile, and a genus closely allied has just (1846) been discovered by Dr. Peters on the eastern coast of the same continent.

The rays and sharks are universally distributed, but many of the species are very local, and are apparently regulated in their range by climatic zones. The seas of Europe can boast of the greater number, though fortunately the most formidable of the species are not of a fished nature. The largest species, as the great Stichus maximus, the basking shark, are harmless, and have their saur-coiters inhabit the temperate zone. Size among fishes does not appear to bear any relation to latitude. Chimaera is northern and southern, extending from the Arctic to the Antarctic. The Sciaenidae inhabit the more southern and tropical, especially the curious forms of Cetra-

Among the most characteristic fishes of the fresh waters of tropical countries are the Siluridae, which abound in the regions of Central Asia, where almost all the species of the typical genus Silurus occur. A single offshoot finds its way to Europe. Pimelodus and Colluchthys are American genera of this family; the electrical Mullirajura, North African; Lorichthys Loricarii, Brazilian, and Pontophryne, an interesting and widely marked is the fresh-water family Cyprinidae. The true carps are characteristic of the old world; Catostoma and Alosa are American.

The genera Centriscus and Fistularia are, with the exception of a single Mediterranean species, tropical. The genera of Labridae have well-marked geographical limits, being grouped together in tropical seas, being replaced in temperate regions by Labrums and Cremniris. There are exceptions, however, of each. The frog-fishes Lophius and Chionorophis are chiefly represented in Africa and South America. A single species of Platyrrhina is a native of European seas. De Kay enumerates seven Lophini as inhabitants of the United States, and Richardson has described some Australian species. The Goby tribe probably reaches Europe; and some of the species of Gobius are remarkable for the depth at which they live. The Blennies are truly European, with very few exceptions. The Gunnela are mostly of northern seas. Some species of the Goby tribe inhabit fresh water, as the genus Tenuiceps, which is found in marshes in India. Comptopus lives in Lake Baikal, and one or two species of Gobius proper live in rivers.

The Magulidae are very generally extended. They have been said to be absent from North America, but this is incorrect, four species of Mugil inhabiting the United States.

The Centriscidae and Platyrrhina are essentially tropical, being all natives of the eastern regions of Asia. Their organization is peculiarly adapted to their climatic range. The Tetraodon are fishes of warm climates, and many species inhabit the coasts of the South Sea, both islands of, fresh water, of which the Gurnard is the type, has a very extensive distribution. The true gurnards are mostly European; Scorpaenas ranges from Europe to Australia. Platydontus is peculiarly Indian. Sphyraena is a genus of the old world, with one or two exceptions.

The Percomtidae, chief of the Actinopterygii, is partly composed of marine and partly of fresh-water genera. The genus Percus is characteristic of the northern temperate zone. Mesoprinus, Dicopen, Dicotreomus, and Scorpaena are cosmopolitan. Mullus and Paralipsa are European genera. Holocentrus, Myrceus, and Priacanthus, and Dusius are represented throughout the entire distribution. Myurus is an Indian fresh-water genus. Percopsis, Paimbus, Centruromus, and Por
da is an American genus of the perch family, Beryx, Trachichthys, Helotes, Pododes, and Chiromya are Australian
IGNICA, a genus of plants belonging to the natural order Burnerales, comprises 16 species, all having petals inserted under the disk, recurved, sepalis, valvate; 10 stamens shorter than the petals inserted with them; a cup-shaped disk with 10 crenatures at the margin; a sessile 5-celled ovary with numerous seeds, ovary style; a 6-angled stigma; a globose obtuse I-celled drupe with thick and fleshy dissepiments; reniform seeds without albumen. The species are shrubs or trees with uncinually prickly leaves, and thorns covered with thickened and punctured racemes which are terminal or axillary.

1. heterophylla has tornate or pinnate leaves, with stalked orate, acuminated, entire, simply-reined leaflets; the racemes shorter than the leaves. The plant is that known as 1. Araucanchini of Aublet. It is a tree 50 feet in height, growing in Guyana, on the banks of the river Couron, where it is called by the natives Araucanchini. When an incision is made in the bark of this tree, a yellow balsamic aromatic fluid exudes, which retains its fluidity a long time after exposure to the air. This fluid is used by the Gyanese as an application to wounds. A resin is found also in the seeds, and the natives of Guiana carry the nuts about with them on account of the scent they give out. These nuts they often send as presents to their friends. The Caribs also use the exudation for mixing with oil with which they anoint their bodies. It was called O CREBOL by Oviedo acuminated leaflets, with the racemes few-flowered, somewhat corymbose, and 6 times shorter than the petiole. It is a small tree, a native of the Guiana and of the Guiana of Guiana. Its root is called ACRÓ. The whole plant is sweet-scented, and like the last species yields a clear balsamic fluid when it is wounded. It is burned as a perfume, and used as a remedy in dysentery. The seeds are collected, with a white resin, into grey vases, and is used by the natives for burning as a perfume. The Carib name of this tree is ARAUCAEB.

There are several species of Icica, all of which yield the same transparent fluid, resembling turpentine in many of its properties.

1. Icicito, a native of Brazil, yields a resin, which is brought into the market under the name of gum elemi, but it is not the resin of this tree that is found in the wood of Guiana, where it is called Chipa. The fluid which exudes from it yields on evaporation a resin. 1. altisima grows in Guiana. There are two varieties of this tree, known by the name of white cedar and red cedar. The latter is a very durable wood, and is used for making household furniture, boats, canoes, etc.

(Don, Gardener's Dict.; Barnett, Outlines of Botany; Lindley, Flora Medica)

IDENTITY. [SAMENES, P. C. S.]

IDIOT. [INNAT, P. C.]

IGNATIUS, Patriarch of Constantinople. The schism of the first three emperors began under Photius, who persecuted this prelate, and usurped his see [PROCTES, P. C.], gives importance to the life of Ignatius. He was born in 798, and was the son of the Emperor Michael Conzobolus and his mistress Alpina, who were the children of Emperor Nicephorus. On the revolt of Leo the Armenian, Michael surrendered to him the throne, which he had occupied for only a year and nine months, and abdicated the monastic life. His sons followed the example of their father, and the youngest, Nicetas, then aged fourteen, changed his name into that of Ignatius. The new emperor, in order not to disturb the possession of power, separated the several members of the family of Michael, and caused his two sons Eustathius and Nicetas to be made eunuchs.

During the reign of the three emperors Leo, Michael II., and Constantine the Maniakes, the Patriarch of Constantinople, and caused Methodius to be elected to be his place. Four years after, on the death of Methodius, the patriarchal dignity was bestowed upon Ignatius, who was consecrated as his successor, and was placed in his monastery, where he had acquired a high reputation for piety and talent, and to accept this perilous honour. He had not long enjoyed this see when the possession of it was troubled by his contest with Bardas, the brother of the empress, whom he had accused of his scandalous excesses. Bardas having obtained considerable influence over the mind of the young Emperor Michael, whose voice he flattered and encouraged, induced him to take the reins of government, and to compel his Patriarch to draw to a convent, and to accept the vows. Ignatius, when summoned to lend his authority to this unifilial act, did not consent himself with remonstrating against it, but gave them a stern refusal. Bardas then caused Ignatius to be banished to the isle of Terebinthos, and deprived of his see, which he had held for eleven years; every means were afterwards employed, but without effect, to induce him to resign. Photius, a eunuch and a person of delicate character, who was very much favoured the Iconoclasts, was by the will of the emperor, but without the consent of the church, appointed to the Patriarchate of Constantinople. The controversy of Photius with the Church of Rome, and its issue, are fully detailed in the article Photius, P. C.

In the year 866 Bardas was put to death; and Basil, the Macedonian, became possessed of the supreme power. One of the first acts of his reign was to recall Ignatius, who was triumphantly reinstated in his patriarchal dignity on the 3rd of November, 867. At his suggestion a Council was assembled at Constantinople, which ranks in the Roman Church as an ecumenical Council. In the proceedings of this Council, Photius and his partisans were excommunicated, and their opinions on the iconography were condemned.

From this time Ignatius was allowed to rule the Greek Church without opposition, and his episcopacy was adorned by many Christian virtues, and by a piety which long and severe persecution could not extinguish. He died on the 5th of October, 878, on which day the Greek and Roman Churches still celebrate his memory. He was buried in the Church of St. Sophia; but his remains were afterwards transferred to that of St. Michael, near the Isoporus. The details of his life are chiefly drawn from Nicetas, his biographer, who had known him personally. It has been published by Bader, Ingolstadt, 1604.


IGNIS FATUUS, a meteor resembling a flame, which floats in the atmosphere at a few feet above the surface of the ground. It is generally observed by night, either stationary or in motion, over marshes or burial grounds; but in the "Philosophical Transactions," for 1694, there is an account of some ricks of hay being burnt at Dolkely, in the preceding year, by a vapour like a weak blue flame which came from the sea: Derham (Phil. Trans. 1729) relates that he observed about a decayed thistle a flame in motion, which receded from him as he advanced towards it; and Beccaria states that he has seen similar flames emitted by a straw which lay on some stones near a river: this philosopher observes that such meteors are most usually witnessed during a fall of rain or snow; he adds that they often appear on country roads and that they have been seen on the banks of the Danube. Tschermak (Deutscher Merkur, Oct. 1763) mentions that he saw at Zellfelder a meteor which at first approached him and afterwards receded from him to a distance of 800 paces; he adds that it then disappeared, and at the end of half an hour it again became visible.

Occasionally such meteors have been observed to follow or advance towards a spectator; but in general they have not ceased to be observed, and it has happened that from their resemblance to the flame of a distant lamp, they have led the unwary traveller into dangerous swamps. Little confidence can be placed in the descriptions given of such phenomena, as few persons have been able to examine them with due attention; and commonly they have been observed under the influence of an ill-regulated imagination rather than a philosophical spirit. A plausible hypothesis which has been proposed in order to account for this phenomenon is that a phosphuretted or a carburetted hydrogen gas, produced by the decomposition of animal or vegetable substances, rises from the ground or from stagnant water, either in the form of a dense mist, or in the form of a cloud, or in great abundance and then becomes a train or a horizontal column of vapour of variable dimensions: such gas may take fire by electricity or spontaneous combustion, and is particularly free from moisture; and the flame communicating itself successively to other parts of a line or column, the latter being in a state of undulation from the agitations of the atmosphere, will give rise to the appearance...
at a motion from place to place. The brightness of the
meteor will change with the varying quantity or purity of
the gas; and its temporary disappearance may be caused by the
quantity being in some places too small to render the flame
visible. Spontaneous ignitions are well known to take
occurrence in a number of vegetable and animal substances
while undergoing decomposition, in consequence of the in-
flammable matter coming in contact with common air or with
oxygen.

II. FORD. There are two places of this name in Essex,
both in the hundred of Reacon. Great Illford is a village
included for civil purposes in the ward and former chapelry
of Barking, on the south bank of the river Roding, 1 mile and
a half from the famous church of Barking. It is one of the
principal towns of the hundred, and has a large
population. It contains many large and handsome
buildings, and is well supplied with water and
convenience for trade.

Little Illford is a parish separated from that of Barking
by the river Roding. The parish has an area of 750 acres,
and contains a population of 23,989. It is one of the
principal towns of the hundred, and has a large
population. It contains many large and handsome
buildings, and is well supplied with water and
convenience for trade.

ILLMEN, LAKE. [REBECA, P.C.]

I'MOLA, INNOCENZIO DA, a pupil of Francucci, and
a distinguished painter, of the early half of the sixteenth
century. His family name was Francucci; he was born
in the latter half of the fourteenth century, and took his
name, but he lived chiefly at Bologna. He painted from
1506 until 1549: Vasari says he died aged fifty-six, but this
is apparently an error, or he must have commenced to paint
when he was thirty or thirty-five years of age. However, the
statement that he worked with Franci, and, according to Vasari, he studied
also with Albertinelli at Florence. In 1517 he produced
what is now considered his masterpiece. It is a large picture,
now in the Academy at Bologna, but formerly over the great
altar of San Michele in Bosco, representing, in the lower
part, the Archangel Michael vanquishing Satan, Saints Peter
and Benedict at the sides, and above them the clouds
the Madonna and Child surrounded by angels; the whole
is treated much in the second manner of Raphael. Il has
been engraved by A. Marchi for the "Pinacoteca di Bologna." There
is also a very superior work by him in the cathedral
of Faenza. Da I'mola's style is termed by Lanzi "Raffigluig"
and it appears that several of his works have passed for
the works of Raphael, that is, for works of his second style. He
was also a good fresco painter.

(Vanvitelli, G. P. T. [R.]; Lanzi, Storia Pictoria,[
R.]; Giordani, Pinacoteca di Bologna.)

IMPEACHMENT. [PARLIAMENT, P.C., p. 279.]

IMPETRATORIA (so named from its supposed imperial
virtues) is a species of the Heliotrope, and one of the most
harmless of the order Umbelliferae. It is a native of
Europe and New England, in damp meadows and woods.
This species is the Masterwort of old English herbalists, and
the root is much used in medicine as an antidote against
poisons, a diuretic, and sudorific; and Lomelino affirms that
an infusion of it in wine has cured agues which have resisted
quinine. When chewed, it exerts a copious flow of saliva,
and acts as an agreeable stimulant to the gums. It is
recommended in cases of rheumatic toothache, and is cultivated
in many places for the London market.

I. angustifolia, the Narrow-leaved Masterwort, has
bitter

ILLEGAI CONTRACT. [PUBLIC POLICY, P.C. S.]

INK. [MASON, P.B.]

INCEST. During the Protectorate in the year 1650,
incest and adultery were made capital offences, but at the
Restoration this law was not confirmed. Incest in England is
now only punishable by the ecclesiastical courts, according
to the rules of the canon law. This law also determines what
kind of sexual connection is incest. Incest may be committed
by married persons or persons unmarrried. If adultery is
committed, it may also be incest, and if fornication is
committed, it may also be incest. The notion of incest is founded
upon the degree of consanguinity or affinity between the
parties who have had the sexual connection.

The term Incest is from the Roman term incestum, which
is the same as Non Cassum, n't pured, 'a its its general
sense signified any offence against positive morality, or
religion. Persons within certain degrees of consanguinity could
not contract a marriage; and if they did contract a marriage
or live together, they were no longer fit persons to live with one
woman, whether married or not, who were incapable of
contracting a lawful marriage by reason of consanguinity. If the
parties were capable of contracting such marriage, the con-
action would be Stuprum, which, in its limited sense, partly corresponds to fornication.

The Roman notion of Incestum was not confined to the case of blood relationship. The exclusion of the fruit of an illicit connexion could not contract a marriage, even after the adopted child was emancipated. The Romans do not appear to have had any direct legislation on this subject till the Codex Theodosianus. The rules of law that were in force were founded upon positive morality and usage. The Lex Julia which was enacted in the time of Augustus treated of incest only indirectly, and so far as it concerned the object of that law, which was the punishment of adultery.

In some cases of incest at Rome, there was capital punishment. (Dion Cassius, liv. c. 22; Tacitus, Annal., vi. 19.) The punishment was inflicted by Reins, Criminalrecht der Rämer, and with a reference to the numerous authorities.

INCH OF CANDLE. [Aucto, P. C.]

INCHBALD, MRS. ELIZABETH, who married name was Simpson, was the daughter of a Suffolk farmer residing near Bury St. Edmunds. She was born in 1753. Prone to romantic notions, and losing her father in youth, she ran away at the age of sixteen to seek her fortune, and endeavoured to procure an engagement as an actress in London. After several adventures, she obtained a place in a country theatre, and soon married Mr. Inchbald, a respectable actor, much older than herself. She longed to live for some years in mutual regard and comfort. Mr. and Mrs. Inchbald performed for four seasons in Edinburgh, and, after an engagement at York, went to France for a time. In 1779 Mr. Inchbald died at London, leaving behind his widow in the most destitute condition. She continued to play secondary parts at Covent-Garden. She continued on the stage till 1789, but always owed her favour with the public less to her merits as an actress than to the sweetness of her family likeness, and to the unassuming character which she was known to maintain in private life. She had begun to write dramatic pieces several years before her retirement from the stage: the first of these, a slight afterpiece, was acted and printed in 1784; and from that time till 1805 she wrote plays in rapid succession, producing nineteen in all, one of which, 'Lovers' Vows,' is an adaptation from Kotzebue. Her dramatic genius was not of a very high class, and several of her comedies had much success, and one or two of them still keep their place on the stage. They gained for her the means not only of supporting herself with honourable economy, but of making a handsome allowance to an invalid sister, and of saving a considerable sum. Her melo-dramatic comedy of 'Such Things Are' gained for her more than four hundred pounds: as much was produced by 'Wives as they Were and Married' in 1802, when on a certain opening night Miss Inchbald, most strongly characterised of her plays, she received seven hundred pounds. She edited, with biographical and critical remarks, 'The British Theatre,' a collection of acting plays, 25 in number, which was published in 1809; and a collection of 'Farcers,' 7 vols. Mrs. Inchbald's literary talents are best exhibited by her two novels, 'A Simple Story,' first published in 1791, and 'Nature and Art,' in 1796. Both became extremely popular, and deservedly so, and have been reprinted in our time in collections of standard novels. She died on the 1st of August, 1821, in a boarding-house at Kensington, leaving nearly 6000l. in legacies to her relatives and friends, to the Roman Catholic poor, to the Covent-Garden Theatrical Fund, and small sums to her laundress and hairdresser, who provided she should inquire of her executors concerning her decease. She had written an account of her recollections, which was published in 1800, and has been reprinted in 1809; and, in obedience to her will, it was destroyed after her death. But her journal, kept regularly for many years, was preserved; and from it and her letters were written Mr. Morley's famous biography of 1833.

INCLOSURE. The term inclosure is applied to the closing and partitioning of lands in England and Wales, which are comprehended under the general name of Commons or Consumable Land. The inclosure of the lands comprehended under this term enables us to form a better estimate of the state of agriculture in England and its capabilities of improvement. We thus learn also what was the state of the condition of the lands in England before inclosures were made.

It is necessary to define the terms Commons, and Consumable and Internized Lands. Commons or Consumable Lands are lands in a state of nature or waste, of which individuals have not the severely. Consumable Lands are those lands which during a part of the year are in severality, that is, occupied severally by individuals as their own, to the exclusion for the time of other persons. The amount of common land in England is not known, but it is conjectured that about 8,000,000 acres: the total area of England and Wales is supposed to be about 37,000,000 acres.

The amount of land in England and Wales which is not inclosed is not known. The nature of those consumable and internized lands may be collected from the following instances. 'There are many parishes in the kingdom that consist altogether of common and internized lands; there are parishes in which the right of the common is sufficient to give an average size of 3 roods and 27 perches, and there are 352 old inclosures containing 677 acres. In the parish of Chelsey in Berkshire, the total contents of which are 2381 acres, there are 2315 pieces of open land, which although not entirely cultivated, give an average size of one acre.' This open land generally consists of long strips, which are so narrow that it is impossible to plough them across. Yet much of this land is the best in the kingdom for natural fertility, and is the oldest cultivated land. There is a great variety in these consumable lands; but they may be divided into three classes, exclusive of woodlands. First, there are open arable and meadow lands which are held and occupied by individuals severally until the crop has been got in. After the crop has been removed, that is, during the autumn and winter, it becomes consumable to persons who have the right of consuming the crop right in it, to consume it in their cattle without any limit, or without stint, as it is termed. Thus there is a divided use in these open lands: individuals have the exclusive right to the enjoyment of one or more of these strips of open land, of the part of the year; whilst another part of the year all these individuals enjoy this open land in common. Second, there is open arable and meadow land that is held in severalty during one part of the year, like the first class; but after the crop is removed, it is held not only to parties who have several rights, but to other classes of individuals: these lands are generally called Lammans lands.

These consumable rights may belong to a particular class, as a body of freemen, or to all landholders. There is great variety in these two classes as to the several rights held in. There are many cases in which the several rights change yearly by year. There are in these open lands what is called a pane of land, in which there may be 40 or 60 different lots. It is reported to be a remnant of an old military custom, whereby the best part of the land was taken possession of by any lot that he thought fit; if his right was called in question, he had to fight for it, and the survivor took the first lot, and so they went on until the parish. It often happens that in many counties, after 1800, in most parishes, it is said by another landowner that this year one this year goes round the whole of the several lots in rotation; the owner of lot one this year has lot two the next, and so on. When these lands are arable lands, they do not change annually, but periodically, according to the rotation of the crops. There is then the old lot meadow, in which the owners draw lots for the choice. There are a great variety of circumstances under which the several ownership of these lands shifts from time to time; but after the severalty ownership has ceased, and after the crop has been removed, they all become consumable.'

This is one among many instances of the existence of the same name or nearly the same name of several similar names of nations that we call barbarous. Tacitus (Germania, c. 26) says of the ancient German mode of agriculture, 'The lands, in proportion to the number of cultivators, which are all daily in the same land, divide among themselves according to their rank (merit). The extensive plains offer facility for division. They change the cultivated fields yearly; and there is still a suavity of soil. That was the meaning of Tacitus, as it is not clear. The following passage in Caesar's account of the Gauls (vi. 22) is more distinct: 'They pay no attention to agriculture, nor has any man a fixed quantity of land and boundaries of property; but the magistrates sometimes scatter colonies to them, and divide among them, as they please, and in the next year they compel them to move to another spot.' Herodotus (ii. 168) says that each member of the military caste in Egypt had a certain portion of land.
assigned to him; but they enjoyed the lands in a rotation, and the same persons did not continue in the enjoyment of the same lands. Strabo (p. 515) mentions a custom amongst the Dalmatians of making a division of their lands every eight years.

‘The third class is that of grazing lands, where the rights of parties are settled and defined, the ordinary stinted pasture. The lands are subject to a great variety of peculiarity; for instance, in some of these lands the right of grazing sheep at all belongs to a man called a flock-master, and he has the power, during certain months of the year, of turning his sheep upon or off all the lands of the parish; or, according to particular circumstances, his right is limited and restricted to turning sheep upon a certain portion of it, with a view to giving parties an opportunity of putting in a wheat in that quarter. In the same style there is a flock-master who has a right of depasturing his sheep during a certain portion of the year over all the land of the parish, it is clear that no one can sow any wheat without having made a bargain with him for shutting up his own particular fields, or some proportion of them.’

‘There is a very large extent of wood-land in this kingdom that is communable, strange to say, where certain individuals have a right during the whole year to turn on stock, the owner of the wood having no means of preserving his property except by shutting out other commoners’ stock by custom for some two or three years after felling. There is that right, as also that of the wood-keeper, which is a very great inconvenience, viz. where parties have the right of cutting house-bute, and plough-bute, and fire-bute, and so on in woods belonging, quid wood, to another party. There is a great deal of land subject to the operation of this ancient custom. There are many varieties of these communable lands, but these are the most prominent and remarkable of them.’

Under such a system as this, it is obvious that these common fields must be put to good use. The intermixed lands cannot be treated according to the improved rules of good husbandry. It is stated that the simple re-deposition of intermixed lands, now held in parcels so inconvenient in form and size as to be incapable of good husbandry, would in many instances raise the free-simelar value of the lands from 15s. or 17s. an acre to 30s.

This is the opinion of witnesses examined before the parliament of 1844, on Commons’ Inclosures, that judicious inclosure would make a large portion of common lands much more productive. At present open arable lands are so intermixed that effectual drainage is nearly impossible. One witness says: ‘I had occasion to go over two small properties, about 150 acres each; one I found in 301 different pieces, and the other is in a little more than a hundred. I mention these as showing the lands are so intermixed that they are therefore farmed at much greater expense; and it is impossible to drain them on the present improved mode of drainage, inasmuch as other parties are occupying the furrow by which the drainage is conducted. I should case off the lands, and make fish-ponds there, where there are these open arable fields, the course is two crops and a fallow, and every third year the flocks run over the whole field. The same witness considers that a fourth of the open arable land is at present totally unproductive. In cases where common arable fields have been sub-divided and allotted, ‘the great improvement is, that in the first place every man has his allotment, and he deals with it as he pleases; he drains it, and crops it upon a proper course of cropping; he puts it in seed and keeps sheep upon it: he grows turnips and clover, or whatever he thinks proper.’

The same witness is of opinion that the average improvement in the inclosed and cultivated fields which have been inclosed is not less than 25 per cent. Indeed the evidence that was produced before the committee establishes to a degree beyond what otherwise would be credible, the immense inconvenience and loss which arise from the system of intermixed lands, and their being also subject to commonage.

As to Common Rights, that is, rights of pasture and so forth on commons or waste lands, they are described generally under the heads of ‘General or Public Rights.’ At present, however, the commoners are entitled to this right of common.

Violent disputes also frequently arise in consequence of the rights of parties to commonage not being well defined. It is the opinion of competent judges that very great advantage would arise upon dividing these parties so that they were not worth inclosure; and that it would be in many instances highly desirable to inclose portions of a common for the purpose of cultivation, and to allot such portions of it, whilst it remains common, to the parties that would be beneficial to the commoners; or that cannot be brought into practical operation; and besides this there are many commons in gross. (Commons, Rights of, P. C.)

Inclosures of land have now been going on for many years. It is estimated that in 1850 there were 32,000 inclosure acts that had passed; and prior to that time about 1600 or 1700. It seems doubtful from the evidence whether the 1600 or 1700 comprehended all inclosure acts passed before 1800. Those inclosure acts (with the exceptions which will presently be mentioned) are private acts, and the expense of obtaining them and the trouble attendant on the carrying their provisions into effect have often prevented the inclosure of commons.

In 1836 an act (5 & 7 Wm. IV. c. 116) was passed for facilitating the inclosure of open and arable fields in England and Wales. The preamble to the act is as follows:—‘Whereas there are in many parishes, townships, and places in England and Wales open and arable fields, and waste and uncultivated pasture lands, and lands of the several proprietors of the same are frequently very much intermixed and dispersed, and it would tend to the improved cultivation and occupation of those lands to subject them to the use of the advantage to the proprietors thereof, and persons interested therein, if they were enabled by a general law to divide and inclose the same,’ etc. Inclosures have been made under the provisions of this act, the power which it gives are limited, for the ‘act applies solely to lands held in several during some proportion of the year, with this exception, that slips and balks intervening between the cultivated lands may be inclosed.’ The lands which cannot be inclosed under the provisions of this act are ‘the uncultivated lands, the lands in a state of nature, intervening between these cultivated lands, beyond those that are fairly to be considered slips and balks.’ However, it was stated in evidence before the committee of the House of Commons in 1844, that a large extent of common and waste land has been illegally inclosed under the provisions of the act, and the persons who hold such lands have no legal title, and can only obtain one by lapse of time. The chief motive to this dealing with commons appears to have been, that they thus got the inclosure done cheaper than by application of the provisions of the act.

In 1814 a select committee of the House of Commons was appointed ‘to inquire into the expediency of facilitating the inclosure and improvement of commons and lands held in common; and the effect of the intro- duction of mixed lands, and into the best means of providing for the same, and to report their opinion to the House.’ The committee made their report in favour of a general inclosure act, after receiving a large amount of evidence from persons who are well acquainted with the subject, the evidence that has been given in this article are from the printed evidence that was taken before the select committee.

In pursuance of the recommendation of the committee, an act of parliament was passed in 1845 (8 & 9 Vict. c. 118), the object of which is thus stated in the preamble:—‘Whereas it is expedient to facilitate the inclosure and improvement of commons and other lands held in common; and other lands being subject to commonage, it is expedient to provide remedies for the defective or incomplete execution, and for the non-execution of powers created by general and local acts of inclosure, and to authorize the proprietors or occupiers of such lands to be entitled to the services of all the commoners in the common, the rotation of all the commoners in the common is not within the scope of this article to attempt to give any account of the provisions contained in the 160 sections of this act; but a few provisions will be noticed that are important.

The 11th section contains a comprehensive description of lands which may be inclosed under the act; but the New Forest and the Forest of Dean are entirely excepted. The 14th section provides that no lands situated which were
the courts of justice and police establishments, in the forms of judicial procedure and laws, due regard being had to the distinction of castes, difference of religion, and manners and opinions prevailing among different races, and in different parts of India. The ground work on which India is placed in the same system of laws as the native population, the influence of the opinion of the former in the administration of justice will prevent abuses to which the latter might be exposed without having the opportunity of urging their complaints in this country. Mr. T. B. Macaulay was the chief member of the first commission. The report of a penal code was presented to the Governor-General on the 15th of June, 1836. The groundwork of it is that it is not drawn from any system of law in force in India, though compared with and corrected by the practices of the country. The principles of the British law, the French code, and the code drawn up by Mr. Living- stone for the State of Louisiana, are the foundations of it. Most of the articles which it contains are accompanied with illustrations to facilitate the application of the law, and it is thus a statute-book for a collection of decided cases. This report was signed by Miers, Macaulay, J. M. Machener, G. W. Anderson, and F. Millet. The progress of the present commissioners in dealing with the general law of India has not been published. (Penal Code, Parliamentary Paper, 1838, No. 673.)

INDUCEMEN[. [MARKING, P. C.] INFAMITY (from the Roman Infamia) in English law is not easily definable. As it has no established definition of itself, so that conviction and judgment for such offences rendered a man infamous and incompetent to be a witness. But the endurance of the punishment, or reversal of the judgment, may destroy the effect of conviction, and so render a man not infamous. When a man convicted of felony has undergone the legal punishment for it, the effect shall be the same as a pardon under the Great Seal; and (§ 4) no misdeemeanour, except perjury or subornation of perjury, shall render a man an incompetent witness after he has undergone his punishment.

The 6 & 7 Vict. c. 85, enacted, that no man shall be excluded from giving evidence, though he may have been convicted of fraud in the purchase of a horse, or horse-dealer, taking and making any bribe, are for ever incapacitated from voting at the election of members of parliament. They are therefore infamous: they labour under infamy: and have lost part of their political rights.

The Roman term Infamia is the origin of our term infamy. Infamia followed in some cases upon condemnation for certain offences in a judicature public and in other cases it was a direct consequence of the act, as an accessory. Among the cases in which Infamia followed upon condemnation, were, insolvency, when a man's goods were taken possession of by his creditors in legal form and sold; the actio furii, and vi honorum raptorum; actio fiduciaria, pro socio, tutelae, &c. In all these cases a judicial sentence, or something analogous to it, was necessary, before Infamia could attach to a person. Among the cases in which Infamia was followed as an immediate consequence of acts which were notorious the following: the case of a woman caught in adultery, of a man being at the same time in a relation of a double marriage, of prostitution in the case of a woman, or when a man or woman is a living aid in prostitution. The consequence of Infamia was incapacity to obtain the honours of the state, and probably the loss of the suffrage also; and it was perpetual. The Infamia was still a citizen (sive priva), but he was disfranchised in his political rights. The infamous man was also under some disabilities as to his so-called private rights. He was limited by the Prator's edict in his capacity to postulate that is, to take the initiative measures for preserving or defending his rights in legal form, and of an attorney of another in such cases, to be a witness, and to contract marriage.

The rules of the Roman law as to Infamia are chiefly contained in the Digest, iii, tit. 1 and 2.
INF

(See Savigny, System des baut. Hüm. Rechts, ii. § 76-83; Beck, Encyclop. of Hüm. Alterthümer, ii. 121; Puchta, Institutionen, i. 441.)

INFANT HEIR. [HEIN, P. C.]
INFANT TRUSTEE. [TRUSTEE, P. C.]
INFANT WITNESS. [Acet, C. G.]

INFECTION, in the law of Scotland, from the same origin as the English term feoffment, expresses the ceremony by which a person succeeding to another by descent, settlement, or conveyance, is invested in any heritable or real property. Down to the year 1845 this ceremony was as pure a feudal usage as it ever had been in the days when the almost universal inability to write suggested symbolical modes of charging the mind. Suppose in a common case—that a man purchases a piece of ground from one who holds it of a superior. According to the system of sub-infeudation preserved in Scotland, he may either be put in the seller's place and hold of the same superior, or he may hold a sub-feu under the seller. Whoever is to be the superior, the title deed contains an authority from him to invest the vassal. Until the late change, a number of persons had to proceed to the ground, consisting generally of the attorney who prepared the titles, and his clerks, who had the following parts to act. One was the bailiff of the superior, and a commission authorizing him to act in that capacity was read over. Another party acted as the procurator or representative of the vassal, in whose name the bailiff lifted some fragments of earth and stone from the soil and handed them to the procurator, as symbols by which, according to the authority given to him, he made over possession of the property to the new tenant. The symbols of this ceremony then placed a coin of the realm in the hands of another party, who must have been a notary public—this being the form in which a protest is taken in the hands of a notary in Scotland. Two other persons, scotsmen, and in the ceremony, with this authority on which it proceeded, was narrated in a deed called an instrument of sajine, in which the notary publicly attested the transaction. The preservation of this cumbersome ceremony down to a later age was owing to its connection with the admirable system of registration which has kept the commerce in real property in Scotland on so clear and secure a position.

The whole ceremony went for nothing unless the instrument narrating it were recorded in the Register of Sases within sixty days after the ceremony. The registration was and is the criterion of preference. If land should be sold or mortgaged to any number of different people, the person whose sais is first registered has the absolute title, and all questions as to the fairness of the transaction, are pecuniary questions to be settled apart from the title to the lands. The cumbersome ceremony mentioned above was rendered no longer necessary by the 8 and 9 Vict. c. 55, passed 21st of July, 1845, and called 'An Act to simplify the form and diminish the expense of obtaining infente in heritable property in Scotland.' It simply provides that 'it shall not be necessary to proceed to the ceremony of being given,' or to perform any act of infente thereon; but saisine shall be effectually given therein and infente obtained, by producing to a notarypublic the warrant of saisine and relative writs, as now in use to be produced. The act itself being infente is not to be kept for recording * * * an instrument of saisine, setting forth that saisine had been given in the said lands, and subscribed by the said notary-public and witnesses.' There has been little opportunity of observing the working of this act; but it is expected that it will materially reduce the expense of transferring interests in landed property in Scotland. A costly ceremony and a long deed, essential to the durability of every title of a new holder, are abolished by it. The act at the same time contains some methods of remedying mistakes and omissions which under the old law were fatal flaws.

In Scotland an infente is defined to be an information or procures any person in the King's courts for an offence against the law or a penal statute. Such a person is generally called a common informer, because he makes a bargain for it. Without any notice or pretence of public interest, he who makes the offender known does the public a service. But the business of a common informer is looked on with dislike, and he who follows it is generally passed over with the apologies for ignorance which is given by modern editors. The informers is generally such that they deserve all the odium they receive. They stand in a like situation to the common

hangman. This dislike of informers, simply as such, is one of the absurdities which are contributed to the real foundation of the dislike however among those who can form a just judgment of things is, not the act of information, but the devices, tricks, and meanesses to which a man must resort when refused, to know the facts which the informa-
tion must be founded. It is the same principle which often leads us to condemn a man for making certain statements in public, not because of the statements, but because of the means by which he may have obtained his knowledge. When a penalty is too heavy, or when the law that imposes it is generally disliked by the people for any reason, good or bad, the popular dislike finds a definite object in the informer w4, giving effect to the policy of law that made the penal law is overlooked, because the legislature is a number of per-
sons; the informer is one, and his agency is seen and felt.

In absolute governments there are spies and political in-
formers, who are the tools of a government which has no rule but its own pleasure. Some people have been dull enough to confound all informers in one class; not seeing that there is a difference between an informer who helps to give effect to the law, and an informer who helps a tyrannical govern-
ment to entrap and punish persons suspected of disaffection to the government or of designs against it.

INFUSORIA, FOSSIL. The geographical distribution of living infusoria seems to be affected by the temperature of reproduction, and the facility of diffusion through water and air, which belong to these microscopic creatures. Fre-
quent in all the varieties of water which have been exposed to the influences of air and sunlight, they are particularly fond of the extremes of terrestrial temperatures, not absent even from snow, ice-covered streams, or the ejections of volcanoes, they have been recognised in all the regions of the globe. Lakes, rivers, and seas, are alike the repositories of these strange inmates of the smaller worlds. In the extreme geological periods of Cainozoic and Mesozoic formations.

The source of the siliceous matter, which enters the organi-
zation of the infusorial races, is not difficult of discovery. Most of our fresh waters contain silica, though not in abun-
dance, derived, it is probable, from the decomposition of felspar and other mineral silicates. Silicate of soda and sili-
cate of potash, thus occasioned, may by intermediate vegeta-
tive processes yield the silica in a state suitable for being organically solidified. Experiments on this subject, which may be easily made, are quite satisfactory in showing that silica can be produced by infusorials (such as express silica, generated in a few days in a sandstone trough, supplied with water and decaying vegetation. The animalcula being dried on the field-glass of the microscope, their beautiful transparent sili-
ceous crusts in the species known as saccharina, from the canic foci, silica is dissolved abundantly, and it is necessary to keep this fact in view while considering the extensive fleshy beds in chalk, the thick Potterschierer beds of Bilin, and other analogous edges of silicified organic remains. These deposits of marine and fresh-water races, which run through all the larger animals and plants with such regularity as to be termed a law of nature, obtains also, but less absolutely, in the in-
musoria, on the less elevated races of the same kind, in many at the junction of rivers with the sea. By comparing the living oceanic and lacustrine races on a large scale, enough
of difference appears in their steneous shields to authorize conclusions more or less positive as to the marine or fresh-water origin of infusorial deposits, which contain identical or analogous forms belonging to earlier periods. Thus the rich deposits of Richmond in Virginia appear to have been formed beneath the sea; the famous deposits of Bohemia, Berlin, and Santa Flora contain admixtures of marine and fresh-water tribes; while those of Bare in the county of Down, and Gainsborough and Bridlington, contain a more considerable proportion of fresh-water species.

Infusoria of marine or estuary origin have been found in a fossil state very extensively in Europe, Asia, Africa, and America. Ehrenberg has described many species from Greece (Zante and Egina), Italy (Caltanissetta and Catanzaro), and Africa (Oera), which occur in calcareous marls, referred by Ehrenberg to the age of the true chalk deposits. These deposits are very extensive in Africa, occupying the whole coast of Oran and large tracts in Egypt and Arabia. Portions of this tract have, however, been described by M. Rozet as tertiary. In the undoubted white chalk of Denmark (Rügen), of France (Meudon), of England (Gravesend and Brighton), infusoria also occur, but less abundantly. North America has yielded a great variety of marine or partly marine infusoria, especially at Richmond and Petersburg in Virginia, at West Point, in Connecticut, Rhode Island, Massachusetts, and Maine. Brazil has also yielded similar deposits.

Infusoria partly of marine and partly of fresh-water origin have become familiar to us in the Polierschiefer (polishing slate) of Bilin and Planitz in Bohemia, and in the Haischwald near Cassel, the Bergmeili of Santa Flora in Tuscany, the white marl in the peat of Fransenbad near Egra in Bohemia, the peat deposits of Gainsborough in Lincolnshire, and at the base of the Mourne Mountains in Ireland. We find them to occur also in considerable plenty, but in limited distribution, in the lacustrine deposits of the East coast of Yorkshire. The Isle of France is added to these localities by Ehrenberg, and New Zealand by Mantell, all the occurrences belonging to supra-tertiary areas.

Infusorial remains are very unequally congregated. The siliceous marl (Kieselschiefer) of Fransenbad consists mainly of Navicula viridis (fig. 6) (now recent); that of the Isle of France, of Bacillaria vulgaris (fig. 7); that of San Flora, of Syndra capitata (fig. 9); while that of Bilin is composed of Gallonella distans (fig. 8) almost exclusively. (Ehrenberg.)

Infusoria are mentioned in the moya (volcanic mud) of Mexico, and in the edible clay of the Amazon River, by Ehrenberg; in the rock salt and the marl which accompany it at Carlsina in Spain, by Marcel de Serres; they are assumed by Ehrenberg to enter largely into the composition of flint, which indeed readily shows Xanthidium and Pyxidium. The bog-iron ore (Raseneisenstein) common near Berlin is composed chiefly of Gallonella ferruginea. A kind of semioil lying in nodules in the Polierschiefer of Bilin is composed of the same siliceous reliquiae (Gallonellae), as the true polishing slate, but they are cemented together and filled by infiltrated silicious paste. With the Gallonella Ehrenberg finds spicula of sponges. The precious porphyry opal of Kaschau, and the serpentine opal of Koesnitz in Silesia, has appeared to Ehrenberg of analogous composition. The following tabular view given by Ehrenberg of some of these facts will be useful:—

1. Bergmeili
2. Kieselschiefer
3. Polierschiefer
4. Sauschierer
5. Semioil of Polierschiefer
6. The above consist entirely or partly of the shells of Shield-infusoria.
7. Semioil of the Dolerite
8. Precious opal of the porphyry
9. Flint of the chalk
10. Gelberde (yellow earth)
11. Raseneisenstein
12. Certain kinds of Steinmark, investing the opal of Kaschau.

The above are probably of the same nature. As examples of undoubted marine infusorial fossils we give below figures of some of the forms most frequent in a white deposit from Richmond.

These are tertiary forms, and below is a specimen of a group referred to the recent genus Xanthidium, and frequent in the flint nodules which occur in chalk.

11. Xanthidium remorum.

Last of species of infusoria from the Kieselschiefer of Fransenbad.—Navicula viridis (plentiful), N. gibba, N. fulva, N. libris, Gomphonema paradoxum, Gomphonema clavatum (fresh water species now living near Berlin); N. viridula, N. atrium (now living in the sea, the second also lives in the Carlsbad water); Gallonella varians.

Species of infusoria in the peat bog of Fransenbad.—Eunotia granulata (plentiful), Navicula viridis (rare), Bacillaria vulgaris, Cocconeis uidentula, Gomphonema paradoxum.
Species which occur in the Kielgauhr of the Isle of France,—Bacillaria vulgaris? (plenteful); B. major, Navicula fulva? N. gibba, N. bifrons (living near Berlin).

In the Bergmehl of Santa Forn.—Synedra capitate (plenteful); this are S. ulna (living both in fresh water and the sea); N. navicula, N. capitate, N. viridis, N. gibba (fresh water species); N. viridula (living in Baltic); Eunotia granulata, Navicula folia (extinct); Cocconeis undulata (waste); Chaetoceros pseudonutum, G. clavatum, G. acuminatum (living near Bremen); Cocconeis cymbiforme (fresh water); Gaillonella italic; Specia of sponge or spongiophile.

In the Pelleneschiefer of Bilin.—Podosphasia nana (plenteful), Gaillonella distans, Navicula scalarum, Bacillaria vulgaris? (probably all marine).

In the Leaf Tripoli.—

Gaillonella distans (plenteful), Podosphasia nana, Bacillaria vulgaris? (probably marine).

At Bann, in the county of Down, Captain Portlock found under peat, Navicula, Bacillaria, Eunotia, with fragments of achnanthes and conocephale. (Microscopical Journal, 1841.)

At Gainesborough, Mr. Binney found under peat, abundance of Gaillonella. At Brillington, we have observed in white and brown marls, Eunotia serrata? Bacillaria vulgaris, Navicula inquinata, N. viridis, N. phegini, N. phegina, N. cintata, a new and beautiful Campillosidis (C. times), &c.

The North American localities have yielded to Bailey and Ehrenberg a large catalogue of infusoria. Ehrenberg enumerates—

Amphiphora—two species. Cocconeis—two species.
Eunotia—seven species. Fragillaria—three species.
Gaphne—four species. Himantidium—one species.
Navicula—eighteen species. Stanwellia—two species.
Tabellaria—three species.

With these are three forms of spongia and spicula, and two species of Thyridiales.

These are mostly derived from beds lying under peat.—The Richmond earth (of miocene date) yields—

Coscinodiscus radiatus and other species (fig. 3). M. Queckett has found several of these recent in the North Sea. Mr. Lee has discovered Coscinodiscus and Dictyochae in the barnacle and scallop.

Actinocyclus coenobitis and others (fig. 3).

Navicula, several species

Gaillonella

Dictyochae fulva (fig. 1).

In the chalky marls of Oran, Sicily, Greece, &c. occur many living forms, as—


Frustularia rhabdosoma—Grassevend.

Striatula—Grassevend.

Gaillonella auriculae—Bügeln.

Peridinium pyrophorum—Grassevend.

Xanthidium furcatum—Grassevend.

hirsutum—Grassevend.

Dr. Mantell has been unable to discover Frustularia in the chalk of Graevesnet, but Xanthidium occur in the chalk of Dover. (Ann. Nat. Hist., Aug. 1845.) Gaillonella auriculae has been regarded as an Oscillatoria; and it appears doubtful whether the so-called Xanthidium of the flint and chalk are really to be referred to as fresh-water genus.

From the preceding notices we may gather as general facts the occurrence of infusoria remains in the following strata:—

Recent Fluvialite and other sediments. Lacustrine deposits of the Elbe period. Deposits of the *Lehm* period.

Cainozoic period


Mesozoic period

Oolitic deposits.

The relative abundance of the Infusoria in these several deposits is so great that their absolute numbers are really the same as those in the recent oceans, and that the relative abundance of the Infusoria is the same as in the Recent oceans (paleontological). It is true that Ehrenberg, by assigning to the cretaceous era the calcareous marls of Oran, Sicily, and Greece, gives a parallel to the Recent oceans, and that the facts that in the favour of such reference of those marls are the Rotalia, Textilina, &c., which occur both in the true chalk and in such marls. But on the other hand, remembering the long scale of geological time through which these genera of Polythalamia extend, and taking into consideration the fact that some species which occur in the chalk of Europe are quoted by Ehrenberg from unquestionably miocene strata in America, we shall hesitate to admit those truly infusoria marls as truly coeval with the white chalk in which comparatively very few remains of the group occur, and these not of the same species as those which occur in the other deposits.

Another point on which the authority of Ehrenberg has not been received without hesitation, is the absolute specific identity of a large proportion of the fossil and recent infusoria.

The most curious discoveries of geology had prepared an easy admission for the opinion that many of the tertiary forms of infusoria were undistinguishable from living races; so is the fact in regard to all the invertebrate races; but with very few, and those always allowed, exceptions, the secondary strata had been found to contain only extinct forms of life, till Ehrenberg examined the minute Polythalamia and found many of them similar to living types, and confirmed this inference by independent researches among the infusoria.

Supposing these opinions of the Prussian microscopist to be confirmed by future inquirers, we shall find that they involve no inference of the relations of zoological forms to geological time, and that they have been established from examinations of the other classes of the animal kingdom. The systems of life in each successive system of strata are not separate and distinct creations, but successive terms of a creative series; each of these terms is compound, and (to speak exactly), its constituent quantitates (the several classes, orders, families, genera, or species) have their own coefficients and exponents; that is to say, have their own times of duration, their own periods of abundance, their own peculiar relations to earlier and later organisations.

A rule drawn from Fishes cannot be applied to Mollusca, a law based on Crustacea cannot be received for Microzoa, without previous examination; and Palaeontology is full of examples of the unequal periods of duration which belong to the different organizations, and the unequal degree of development, and unequal geographical diffusion, which characterise these organizations at the same epochs and during the same periods.

Admitting the authority of Ehrenberg's determination of species, we find another curious and unexpected result—the frequent, if not general, admixture of marine and fresh-water tribes—in the comparatively level regions of Europe. In the plains of North Germany, round the Bohemian and Harz mountains, in Tuscany, and Yorkshire, we find this admixture of supposed marine and supposed fresh-water races, in the supra-tertiary deposits. Is this to be explained by supposing those deposits to have happened while the relative level of land and sea was different from what it is at present, and the sea was near to the place of deposition, so that by some of the many natural modes of diffusion which are effective in this class of life, the organisms of the sea might be carried into lakes, as well as mixed in estuaries, and along the course of languid rivers? Probably so. The deposits of infusoria which now happen so abundantly at the mouth of the Elbe are mostly derived from the sea; and it is highly probable that the fresh-water species which we imagined to be truly marine live in juxtaposition with the species of fresh waters. There may probably be, in a class of beings associated with alluvial waters, a greater independence of species, and more time to distinguish the species which have little need of silica, and which require the extrication of lime from a state of solution in the waters which they inhabit. In confirmation of this view, we find the
spangle of the sea matched by the spangle of fresh water, each extracting alien from the liquid, but the caudacious Physiological Subjects, by the result of their observations, is almost unrepresented in our inland lakes and streams.

(Heubner, Die Infusionshistorien; Mem. of the Berlin Academy, and Translations in Taylor's Scientific Memoirs; Readings, in 1790, "Papago Indians," etc.)

INGEN-HOUSZ, JOHAN, a distinguished natural philosopher, was born in Belgium in 1738; for some years he practised medicine in that city, and employed his leisure in the performance of experiments in chemistry and electricity; but, at length, quitting his native country he came to London, where he was employed in the branches of science so actively engaged in by the notice of the English philosophers, and led in 1769 to his being elected a Fellow of the Royal Society. He had the good fortune to obtain an introduction to Sir John Pringle; and this celebrated physician, immediately appreciating his merits, warmly encouraged him in the prosecution of his researches, and honoured him with his esteem and friendship; he also frequently had corresponded with Franklin on the subject of electricity, which was, at that time, rapidly rising in importance.

The reputation of Ingen-housz as a physician must have been considerable, for the Empress Maria Theresa, who had lost two of her children by the small-pox, having directed her ambassador in London to consult Sir John Pringle respecting the choice of a physician whom she might invite to her court for the cure of her two remaining children, and in the person of the imperial family, Sir John, then president of the Royal Society, without hesitation recommended Dr. Ingen-housz: the latter, accepting the invitation, set out, in 1772, for Vienna, where he performed the operations with complete success. The example of the sovereign was followed by the nobility of Austria, and the children of the highest families of the country were inoculated by Ingen-housz or under his immediate direction. In testimony of her sense of his merit and attention, gave him the title of auspice councillor and imperial physician; and accompanied these honours with the grant of a pension, which he enjoyed during the rest of his life.

During his residence on the continent, Ingen-housz visited Italy, France, and various parts of Germany; and, at intervals, continued to prosecute his researches in electricity and magnetism, and on the air produced by plants. While at Vienna, the emperor Joseph II. honoured him with special notice, inviting him frequently to the palace, and occasionally visiting him at his own house. In order to witness the performance of his philosophical experiments. During a visit to Italy in 1773, Dr. Ingen-housz had an opportunity (at Leghorn) of making some experiments on the torpedo: he found that the electric fluid was absorbed by the body and that when he attempted to bend its body; these shocks were sometimes so strong that he was almost obliged to quit his hold, and he remarks that they resemble the discharge of a number of sable nettles.

After an absence of several years, Dr. Ingen-housz returned to England, where he continued to prosecute his experiments; and an account of an electrophorus, which he had invented, is described in the 'Philosophical Transactions' for 1778. About the same time he made the discovery that plants exposed to the light while growing, discharge oxygen gas from their leaves into the atmosphere; and an account of his researches relating to this subject was published in London in 1779 under the title of 'Experiments upon Vegetables, developing the power of purifying the Air in the Sunshine and of injuring it in the Shade,' etc. The work was translated into French by the author and published in Lauenburg in 1780.

In the 'Philosophical Transactions' for 1779, there is an account of an electrical machine which, about that time, Dr. Ingen-housz had constructed; this consisted of several pasteboard boxes of a large size, which, when covered with varnish were fixed upon a axis; between every two of them was a board covered on both sides with flannel and then with hare's skin; and the friction produced when the boxes were revolved caused the discharge to obtain from the machine sparks above a foot in length. This probably led to the invention of the plate electrical machine, which is generally ascribed to Ingen-housz, though it was composed of two cushions, forms a very elegant and, if made of considerable magnitude, a very powerful apparatus.

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Dr. Ingen-housz published in English a work entitled 'New Experiments and Observations concerning various physical bodies.' He was elected a member of the Royal Society, and lived in Paris. He also published, in French, a work entitled 'Essai sur la Nourriture des Plantes,' which was translated into English and published in London in 1798.

(1) Ingen-housz, in Sept. 1790, married a country-house, near London, in the sixty-ninth year of his age.

(Biographie Universelle; Philosophical Transactions.)

INHIBITION, in the law of Scotland, is a writ by which a creditor may prohibit his debtor from alienating property either to favoured creditors or to other persons. Nominally it affects all property, but it is only in the case of heritable or real property that, from its standing on the register, it is efficacious. The effect of the act is generally to prohibit any act which must be founded on some obligatory written document, or estab-

lished by the decree of a court. It may be recalled if improperly awarded. It conveys no specific security to the person who holds it, but it gives him a right to impugn any act which the debtor does to his prejudice regarding his real estate. It does not affect the validity of a sale for a fair price, but it gives the inhibitor a right to the purchase so far as his debt extends. If the inhibition be followed by proceedings to attach the estate at the instance of the other creditors, the inhibitor has a preference over them if the debts have been incurred solely or chiefly to the injury of one of them.

The mixed rights thus occasioned are often productive of very intricate questions.

INJURY, INJURIES. As these words are vaguely used, it is as well to state the meaning of the word used by Blackstone, after treating of Rights, proceeds in his Third Book (c. 1) to consider the wrongs that are forbidden and repressed by the laws of England. He then divides Wrongs into two sorts or species:—Private wrongs and Public wrongs. To Private wrongs he also gives the name of Civil Injuries, as being 'the infringement or violation of the private or civil rights belonging to individuals considered as individuals.' Public wrongs are 'a breach of public rights and duties,' and are distinguished by the harther appellation of Crimes and Misdemeanours.

This is a confused statement. The true nature of Injury is however contained by implication in another expression in Blackstone --- 'the contemplation of what is Jus is necessarily prior to what may be termed Injury.'

The English law has in fact adopted many terms of the Roman law; and if Blackstone had always traced their meaning correctly, he would have written less confusedly. As Jus is law, so Injury is something that is not Jus, or is forbidden by Jus. An Injury then, in the English law, is some illegal act; but the word is commonly used to express an illegal act done to a man or his property, for which he may by legal process get compensation. The English legal maxim that a damages must be proportional to the compensation which is given for a damnum absconditum, contains in it the true meaning of injury or injury. The act must be an illegal act in order to entitle a man to compensation. If a man's acts damage the property of another, or even the body of the person himself, and the person who is damaged can get no compensation. For instance, a man may set up a grocer's shop next door to another shop, and get all his neighbour's custom, which is a grievous 'damnum,' but no 'injury.' It is true that the nature of the damage may in some cases help to determine whether it is a legal injury or not; but the true question always must be whether the act complained of is either an common law or by statute an unlawful act.

The Roman word Injurias, as already observed, signifies generally anything which is done contrary to law (quod non jure factum est, hoc est contra jus). In its narrow sense, Injurias was limited to unlawful acts that affected a man's person, not his property, at least not directly. It comprehended personal violence, such as beating a man, and using abusive words to him, and libelling a man. Injuries might also be inflicted by virtue of a thing to which another was a possessor of those who were in his power, as his children and slaves, or in his hand (manu), as his wife. The mode of proceeding was by the Actio Injuriarum. (Gombrich).

The nature of wrongs or Injuries in its limited sense is, therefore, it appears, different from that of Injury in English law, as properly understood. For Injuries in English law, as Civil Injuries, a man could sue in Blackstone's time, comprehended all the wrongs that are treated of in his Third Book, that is, all wrongs except Crimes and Misdemeanours. The Roman Injurias belongs both to the head of Law Criminal

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and Non-Criminal. In some cases damages were got in
the form of a fine, and in his person: in some cases he might be punished by a pecuniary penalty and in his
person also.

The common, the non-legal, use of the words In-
juries and Damages is a popular notion of Right and
Wrong generally. But people have often a clear per-
ception that a damage is done for which no compensation
can be got by legal means, though compensation is due ac-
cording to the popular principles in which the common notions of right and wrong are based. The popular judgment here is often right, and is a foundation on which good and efficient legislation can be securely based.

The inability of inquirers for the safe custody of the goods and chattels of their guests is one out of the numerous classes of cases that arise upon the law of bail-
ments, and is placed by Sir W. Jones, in his Treatise, under the second subdivision, Locatio Opera, of the general head Locatum. The law makes the inkeeper responsible for the safety of the goods of persons coming to his house, in the language of the ancient writ, causai hospitali; but he may be released from his liability either by inattention on the part of the guest to such reasonable rules as the inkeeper may think proper to lay down for the protection of the property of the guest himself, or by his making use of the house not as it is before said, causai hospitali. Thus, if an inkeeper requires his guest to put his goods under lock and key, and the guest leaves them in a passage, whereby they are lost or stolen; or the goods are stolen by the guest's own servant; or the guest uses his room in the inn as a show-room, into which a number of people are allowed to have access, and not as a lodging-room, the inkeeper is not responsible for the loss of the goods. The interest seems to require that the law should be made still more strict as against inkeepers, as the good faith and responsibility of the inkeeper form the only security of the traveller. The Roman law on this subject is contained in the Digest iv, tit. 2.

(Smith's Leading Cases, ' Calye's Case'; Treatise on the Law of Bailments, by Sir W. Jones.)

INSANITY. Insanitas, P. C. 8 J.

In inscriptions (Inscriptiones) that is, records of public or private occurrences, of laws, decrees, and the like, engraved on stone, metal, and other hard substances, exhi-
bit ed for public inspection. The custom of making inscrip-
tions was infinitely more general in the states of antiquity
than in any modern country, as we see from the innumerable inscribed monuments which still exist in Persia, Egypt, Greece, Italy, and other countries subject to or colonized by the Greeks and Romans. A great number of inscriptions, especially those recording great events, laws, or decrees of the government, which it was important for every citizen to know, supplied to some extent the want of the art of printing. While the absence of the laws of the state was sometimes, in the days of the Roman emperors, set up in public, this public exhibition was equivalent to their publication by means of the art of printing, for every Roman might go and read them, and, if he liked, take a copy of them away with him. Therefore it is not surprising that the art of printing, inscriptions set up in a public place were the most convenient means of giving publicity to that which it was necessary or useful for every citizen of the state to know. Inscriptions therefore are, next to the literature of the an-
tiquity, the most important sources from which we derive our knowledge of their public, religious, social, and private, and their study is indispensable to the inquirer who desires to become intimately acquainted with the history of antiquity.

For the history of the languages they are of paramount im-
portance, since in most cases they show us the different modes of writing in the different periods, and exhibit to us the lan-
guages in their gradual progress and development; though it is manifest that the antients did not bestow that care upon the accuracy of the language and orthography which we might expect, and in many cases they seem to have left those things to the inquirer who executed the inscription. After the over-
throw of the Roman empire in the west, inscriptions still con-
 tinued to be made very frequently; but as the ignorance of the languages became more and more confined to the priesthood, the custom of making certain things known by means of inscriptions gradually fell into disuse, until the art of printing did away with it almost entirely.

In order to render inscriptions as permanent as possible, the antients chose such materials as were least subject to de-
struction, viz. stone or metal. The stone most commonly
used was marble cut in slabs, but sometimes inscriptions were wrought upon a flat surface of the same stone. The most usual metal was brass or bronze, though we have instances also of lead, tin, and gold being used. If we believe the accounts of the antients, inscriptions were made even in the mythical ages (Hesiod, Theog. 84, 8; Hesiod, Works and Days, 11, 1), but such inscriptions, existing in later times, were probably forgeries, and we cannot suppose that inscriptions were made until the art of writing was very generally known.

We also have inscribed monuments of Persia (Arabische Characters, P. C.), the hier-
oglyphics of Egypt, and the now unintelligible inscriptions of Etruria, Lycia, and other countries, and confine ourselves to those which relate to Greece and Latin.

Greek Inscriptions.—The earliest Greek inscriptions which we may safely take to have been genuine, but all of which have perished, were the lists of the victors in the Olympic games (Paus. iii. 21, 1; v. 4, 6, &c.), the records of the musical contests at Spicon (Plutarch, De Mus., 3, 8), and the chronicle of the priesthoods of Hera (Junon) at Argos. The earliest among the extant inscriptions do not seem to have been made much before the year n.c. 500.

All inscriptions are composed either in prose or verse, but the former compose by far the greater number. The prose of the inscriptions is very much like that of prose writing in general, and is unlike that of official documents of our own time. All Greek inscriptions are written in capital letters, and without any punctuation or separation of the several words, which often renders the reading difficult. Some inscriptions are written in the characters phaenomenon, some in the characters bombycida. Some of the earliest inscriptions are written, like the Hebrew, from the right to the left; others varied their lines, the first being written from the left to the right, and the next from the right to the left. But besides these general distinctions, there occur a great variety, and some modifications of writing which are the result of mere fancy. Another important point which it is necessary to know before attempting to read Greek and Latin inscriptions is the difference in the use of names and words (sigla), which have been described and explained in several works, such as Nicolai, ' De Sigilis Vetricurn,' Lugdun. 1703, 4to; Maffi, 'De Graecorum Sigilis Lapidaria,' Verona, 1746; E. Corini, 'Notae Gramm.,' Florence, 1749, fol.; Placentinus, 'De Sigilis Vetricurn,' Rome, 1757, 4to.; but the best work on this subject is Franz, 'Elementa Epigraphiae Graecae,' Berlin, 1840, 4to., which is at the same time the most complete introduction to the study of Greek inscriptions.

Public or state documents were exhibited in Greece in cer-
tain places of great publicity, as the Aeropoli at Athens, and the agora at Corinth. The same was also the case with receiving marble or metal slabs with inscriptions. Market-
places and temples likewise served as repositories for inscrip-
tions. When it was intended that an inscription should be permanently engraved on stone, a certain form of the art of engraving was invented. The oldest languages of both (inscriptiones bilungiae), as in Greek and Assyrian (Herod. iv. 87), Greek and Palestinian (Gen- semia, Mommsen, Phoenic., i. p. 98, &c.), Greek and Latin, Greek and Lycian (Grotefend in the Transactions of the Royal Society, i. 2, p. 317, &c.), and Greek and Egyptian, as on the Rosetta stone in the British Museum, of which another copy has recently been discovered by Layard.

The necessity of making collections of the most important inscriptions, such as contained public decrees, or interesting epigrammatic poems (of which many have found their way into the Greek Anthology), was felt by the Greeks themselves. The earliest collection we know of is that of Philochorus, under the title of 'Eγγραφα μιας Αυταίρ; ' his example was followed by Polemon in a work Περί τῶν κατὰ Πόλεις Εγγράφων, and especially by Craterus in the important collection en-
titled Συναγωγή Θερμα'ων. Although public inscriptions were under the protection of the state, and although their violation was severely punished, we nevertheless know of books of inscriptions that were either destroyed or mutilated in certain cases. The state itself ordered the destruction of public documents, as when decrees were annulled or abolished. In times of war and in the destruction of cities, innumerable inscriptions were perished. Athens, as early as the time of the Persian wars, gives us an example of the destruction of public monuments, as pillars, and inscriptions with inscriptions, for the purpose of
building walls for the protection of the city. In the fourth century of our era religious fanaticism caused great destruction of monuments which were frequently used as building materials for all kinds of edifices; and if, in addition to all this, we consider the ravages of time and the accident of war, it is not surprising that the immense number of inscriptions that have been preserved down to our own time.

The first modern writer who conceived the idea of making a collection of all ancient inscriptions, or at least of the greater part of them, was, as far as we know, the learned Mr. Hamilton, who undertook, in a.d. 1430, a journey through Italy, Greece, and Asia Minor, and brought back a great number of inscriptions, which he collected in 3 vols. MS., which are still extant and in the library of Leiden. Mr. Hamilton's labours have often been used by subsequent collectors. After Cytinus a long time elapsed, during which the attention of the learned was chiefly directed towards Roman inscriptions. Scipio Maffe, and after him J. Caracci and T. M. Rapou, formed the plan of a complete collection of all inscriptions, but none of them were able to carry it into effect, and people were satisfied with books containing such inscriptions as their authors happened to meet with, or thought of particular interest. Works of this kind are:—Janus Gruter, 'Inscriptiones Antiquae totius Orbis Romani,' Heidelberg, 1602, 2 vols. fol.; 'Marmora Arunsiana' (also called 'Oxonensia,' containing twenty-three Latin inscriptions from Oxfordshire, and in each paper, London, 1829, 4to., by P. Duxford, 1876, by Maittaire, London, 1792, and by Chandler, Oxford, 1703; Oct. Palæografinia, 'Inscriptions Athleticae Graecae et Latinae,' Rotterdam, 1698; W. Fleetwood, 'Inscriptionum Antiquarum Syllogos,' London, 1691, 8vo.; R. Fabretri, 'Inscriptiones Antiquae,' Rome, 1899; A. van Dale, 'Dissertationes Antiquariae et Marmorae Rum Romaniae tum Graeciae illustrissimae Inscriptionum,' Amsterdam, 1702, 8vo.; A. F. Gori, 'Inscriptiones Graecae et Romanae quae extant in Etruriae Urbibus,' Florence, 1727, 3 vols. fol.; L. A. Muratori, 'Novum Theaurus Vaticanum,' Rome, 1736, a work in 4 vols. fol., of which eight fasciculi in fol. appeared; and F. G. Velcker published a smaller collection of metrical inscriptions, 'Sylloge Epigraphum Graecorum ex Marmore et Tarso,' published in 1743.

But in the meantime the Berlin Academy had formed the plan of publishing a complete collection of all the known Greek inscriptions, of which A. Boecke undertook the editorship. The work was called 'Inscriptiones Graecae et Latinae,' and in 1836, 1 vol. 8vo., containing 1862 inscriptions. Vol. I. appeared in 1836, and besides the most ancient inscriptions, it contains those of Attica, Megaris, Peloponnesus, Boeotia, Locris, Phocis, and Thessaly; the second volume, which appeared in 1843, contains the inscriptions of Aegina, Euboea, Illyricum, the islands of the Ionian Sea, of Macedonia, Thrace, Serbati, the islands of the Aegean, Rhodos, Crete, Cyprus, Caria, Lycia, Myasis, and Bithynia. This great work, in two huge folios, is now the most complete collection of Greek inscriptions. They are arranged, as appears from the above enumeration, according to the towns and localities in which they are found; and in each particular where it is feasible, as in those of Athens, Boecke has judiciously classified them into ten sections:—1. Acta senatus et populi, universitatis et collegiorum; 2. Tabulæ Magistratuum; 3. Tituli Militares; 4. Magistraturum Catalogus; 5. Aegonistica et Gymnastic; 6. Honores Imperatorum et aliorum ex dono Augustæ decreta imperatoria; 7. Tituli Honorari; 8. Donorum Tituli et Operum Publicorum; 9. Conspectus romani imperii; 10. Monumenta privata, maxima sepulchralia. It is partly owing to the influence which Boecke's 'Corpus Inscriptionum' exercised upon the scholars of our time, and partly to the fact that the work was for a long time the only one published, the first volume of Boecke's work a prodigious number of inscriptions have been brought to light by travellers, which were before unknown. Some of them have been incorporated in the second volume of the 'Corpus Inscriptionum,' but others were published too late for insertion, and will be published in a subsequent volume. The list of those inscriptions which have been incorporated in the work of Mr. Hamilton contains a large number of inscriptions from Asia Minor; and lastly Letronne, 'Recueil des Inscriptions Grecques et Latincs de l'Egypte,' voL. i., Paris, 1842, 4to.; and the Philological Journal of Germany, France, and England.

Latin Inscriptions.—These are not less numerous than those of Greece, and are found in great numbers at Rome, in Italy, and all the countries subject to Rome. They embraced the same variety of subjects as the inscriptions in Greece, and if only the principal ones had been preserved the early constitution of Rome would be comparatively clear, whereas now our knowledge of the most important events is confined to what we can only answer by conjectures. Some of the Roman writers have, it is true, made use of the most important inscriptions for the early history of Rome, but not by any means so much as is the case with the histories of Greece. The work of Cytinus does not appear to have been so much directed towards this source of information as that of the Greeks, for there is no instance in the labours of Cytinus, which are published by the Romans themselves, although some of them were of the very highest importance in a constitutional as well as legal point of view. At the time of the overthrow of the Western Empire thousands of inscriptions must have perished, especially those engraved on metal, as the material attracted the avarice of the barbarians. But a great number was still preserved in Rome and Italy, which attracted the attention of the learned even in the middle part of the last century, and the present time.

The oldest collection of inscriptions found at Rome, exists in the monastery of Einsiedeln; it is written on parchment, and probably belongs to the tenth or eleventh century. It was printed in Maihilion ('Vetustus Annum,' p. 365, &c.). At the time of the revival of letters, the attention of the learned was chiefly directed towards the authors of antiquity, but ever since the fifteenth century attention has also been bestowed upon inscriptions. The man who first formed the idea of a comprehensive collection was the above-mentioned Cytinus, who undertook his travels at the request and the expense of Pope Nicholas I. The first printed collection of Latin inscriptions is that of Diberti, who published those which were found at Augsburg and in its neighbourhood on seven folio leaves, under the title of 'Romanae Vestimentis Fragmentis' in Augusti Vindeliciorum et ejus Dioecesi,' Augsburg, 1545. Another collection, now extremely rare, was published by Laurentius Abstemius, at Fano in 1516, of which a second edition by P. Polyarchus appeared in the same year. The work published by the book-seller Mascani, at Rome, in 1520, in folio, under the title 'Epigraphum Antiqua Urbis Romae,' contains scarcely any other than sepulchral inscriptions.

After these collections of local inscriptions, B. Amentius and P. Apianius, supported by the liberal merchant Raimund von Fugger, published a general collection under the title of 'Inscriptiones Sacramentorvm Vestatvm,' Ingolstadt, 1584, fol. Soon after, the learned George Fabricius published a considerable collection of Latin inscriptions which he had made in his travels, and which had been communicated to him by his friends, in the second volume of his 'Roma,' Basle, 1590, reprinted in 1597, and at Helmstadir, 1600, fol. Martin Sacentius of Bruges, during a stay of six years in Italy, made a very careful collection of inscriptions, which however were not published till after his death by James Doua, and with an exact commentary by J. Gaffurius, 'Inscriptionum Romanorum veterum,' Paris, 1660, fol. Martin Serenus of Laurentius Schneider, 'Monumenta Italice,' has one volume which contains only inscriptions which he had collected during his visits in Italy; they are arranged according to the towns in which they were found, and the differences found between the earlier and later inscriptions, and he has some which are evidently not genuine. After that of Schrab followed that of Thon Reinicius, which was continued
above. A somewhat more complete and accurate collection of 4688 inscriptions was published by Fabretti under the title 'Inscriptionum Antiquarum, quae in Aedibus Paterni asservantur Expositio et Additamentum,' Rome, 1699, fol. (some copies up to a date of 1702, but this is only a bookseller's imposition).

But all the works here mentioned are eclipsed by the undertaking of Janus Gruterus, which was to contain all the inscriptions that had until then been made known. He took the work of Smedius as his foundation, and was actively assisted by Joseph Scaliger. The collection appeared under the title 'Inscriptiones Antiquitatum Romanorum,' Gruter, 1573, 8 vols. 4to., and Josephus Scaliger afterwards undertook to edit a still more complete and corrected edition, but he did not live to complete his task, which fell into the hands of P. Burmann, who, assisted by many learned scholars, published the new edition of Gruter, under the title 'Inscriptiones Antiquae totius Orbis Romanorum,' in absolutissimam Corpus redactae, aliqui suspecta J. Scaligeri et M. Velsleri, industria autem Jani Gruteri, nune notis Marquardi Godii emendatae, cura J. G. Graevii, Amsterdam, 1707, fol. Marquard Gude, who had travelled in Italy, likewise prepared a collection of inscriptions for publication, which however was edited after his death by F. Hessel, Ludovisi, 1731, fol. This collection however contains many forgeries made by the notorious Ligerius. A collection of 2000 inscriptions which had been gathered by Doni, was published by Gori, 'T. B. Donii Inscriptiones Antiquitatum Romanarum Libri IV,' in folio, 1731. Doni also published his 'Novus Thaurusarum Veterum Inscriptionum,' Milan, 1739, 4 vols. 4to., with a supplement by S. Donatus in 2 vols., Luca, 1755, 8vo. Among the collections of inscriptions that at a later time, with increased importance, with the exception of the selection from all the known inscriptions which was published by J. C. Orelli, under the title 'Inscriptiones Latinarum selectarum ad usum Simplicissimi Colleto ad illustrandas Romaniae Antiquitates ejusdem civitatis accommodatae, &c.; cum ineditis Hagenbuchi suisque Annotationibus,' Zurich, 1828, 2 vols. 8vo. This collection is extremely useful, but it is to be regretted that the editor has not published the inscriptions with the necessary accuracy and exactness which are required in works of this kind.

In modern times the number of Latin inscriptions found in the various parts of the world which once were subject to Rome, has been increased enormously, and will increase every year, as archæological societies are formed in all parts of Europe, with the express object of searching after, preserving, and publishing the Roman monuments existing in the particular districts in which those societies are formed. The number of Latin inscriptions now known amounts to about 60,000, and that of a new and complete collection has long been felt. The Danish scholar Olaus Kellermann, who lived in Italy for some time, formed the plan of publishing a collection of Latin inscriptions similar to the 'Corpus Inscriptionum Latinarum,' Brockh, but in 1837 presented the carrying out of his plan. O. Jahn honoured his memory by the publication of his 'Specimen Epigraphicum in Memorian Olai Kellermann,' Kiel, 1841, 8vo., and it is planned to publish a complete collection of all the known Latin inscriptions has recently been held out. On the 6th of July, 1843, Villemain, the French minister of public instruction, requested the Academy of Inscriptions in Paris to prepare such a collection, and a commission of French savans has been appointed to conduct and superintend the work. Several pamphlets have since appeared both in France and Germany, containing suggestions respecting the principles which should be followed in the arrangements of the inscriptions.

Among the works to be consulted by those who wish to acquire a facility in reading and understanding Latin inscriptions, the following are of particular importance: 'The Ephemerides of the Lapidaria,' Rome, 1770, and Venice, 1792; Morelli, 'De Stilo Inscriptionum Latinarum Libri Tres,' Rome, 1781, and in 1842, 4 vols. 8vo.; Kopp, 'Palaeographia,' London, 1839, 4 vols. 4to.; and Orelli's Introduction to his Collection.

Insecta. FOSSIL. Until within a few years the occurrence of insects in a fossil state could only be substantiated by geologists by the discovery of localities, situated (as at Aix in Provence) among lacustrine tertiary strata, or (as at Stonesfield in Oxfordshire and Solenhofen in Franconia) among marine oilite beds. But Mr. Prestwich has added traces of coleoptera from the coal formation of Coalbrookdale, and Mr. Strickland parts of neopterans from the cliffs of Warwickshire; Mr. Buckland obtains neopterans from the cliffs of Stonesfield, and Mr. Brodie portions of insects belonging to various natural orders from the cliffs of Somersetshire, in the Wiltshire and in the Vale of Wardour in Wiltz, and the Vale of Aylesbury. Still the number of fossil insects, whether we estimate individuals or species, is very small compared to the probable number of animals existing; a circumstance which has explicable by reference to the phenomena which are now taking place in nature; for of upwards of 12,000 British species of insects there is reason to believe that with a very minute proportion of those which exist in the wild state, and are preserved in lacustrine, estuarine, or marine deposits now in progress. Only one elytron of a small beetle was observed in a deposit of the elephantoid era in Yorkshire, and one species of sambelline plant, along with hundreds of shells which inhabited the lake.

No doubt vast numbers of insects, wandering by capric or drifted by winds, pass from the shore and fall in the sea: we learn from the first voyage of Cook, who sailed through myriads of insects, some on the wing and others in the water, even thirty leagues from land off the coast of South America; but few of these escape the watchful finny races, or ever reach the bottom of the sea.

In like manner we find land insects humped in profusion by winds on certain tracts of fresh water, and borne down the course of rivers. This fact is of great importance to those who make use of particular suppositions, such as evaporation or slow draining off of the water, may offer the nearest analogy to the facts actually observed in the greater number of insect deposits.

The collection of neopterans is therefore to be regarded as an exceptional case, and this makes the circumstances brought to light concerning them remarkable and difficult of interpretation. We find however from Mr. Brodie that the shells in a certain bed or mass of thin beds in the lakes; similarly they occur particular lakes in the colite, the Wealden deposits, and in the tertiary accumulations of Aix, Oeningen, and Auvergne. In the latter region the ancient inhabitants of Aix, Oeningen, the use of animal deposits in the formation of peculiar limestones ('Insidial Limestone'). In the following summary of the groups of fossil insects in Britain, the most recent stratifications come first. The catalogue commences with the elephantoid era. The authorities and localities are given for each case. (See Morris's Catalogue of Fossils; Brodie's Fossil Insects; Lyell, 'Geol. Pr.'; Phillips, 'Geol. Yorkshire'; Strickland, in 'May. of Nat. Hist.'; Buckland, 'Bridgewater Treatise' and 'Geol. Proceed."

1. Pteroptera fresh-water deposits ('Pleistocene').

Elytron of a Chrysomya. Bliedews, in Yorkshire. (Phillips.)

2. Remains of Copris lunaris. Mundenes, Norfolk. (Lyell.)

3. Donacia. H. Levis, in Yorkshire. (Lyell.)

4. Coleoptera. Southwood, Suffolk. (Alexander.)

5. No true aquatic beetle is mentioned among these. Donacia haunts aquatic plants. The others are strictly terrestrial. They may have been drifted into the lakes in which the Planorbis, &c., lived.

2. In the Cretaceous System, no insects yet found.

3. In the Wealden strata of the Vale of Wardour (found by Mr. Brodie and examined by Mr. Westwood).—

1. Land Coleoptera, of the families—Carabidae; Harpalidae; Staphylinidae; Buprestidae; Tenebrionidae; Elateridae; Curculionidae; Cantharidae; Helyphoridae. Aquatic Coleoptera of the families—Hydropilidae; Dytiscidae; (Colymbetidae)

Orthoptera, of the genera Achatia and Blatta.

Hemiptera and Homoptera, including land tribes, as Cimicidae, Coreidae, Heteroptera, &c.; aquatic species of Vella and Hydrometra.

Neopterans. In this water-haunting order occur Libellula and Eulisma, Cordylidae, Libellulidae, Termeutes and Leptoceridae.

Trichoptera. (Councilia, Tiphulina, &c.)

Diptera. Simulium; Platyrrhina; Tanytarsus; Chironomus; Culex; Tipulidae, &c. (Aquatic larva) Empidinae.

4. In the oölite strata, insects occur in a state of preservation probably little inferior in number of Stonesfield and several other localities in Gloucestershire and near Bath. Mr. Buckland has described several species in the Geological Proceedings and in his Bridgewater Treatise on Geology, and Mr. Brodie has added others. The remains are chiefly Elytra of Coleoptera.
and wings of Neuroptera. The following is abstracted from Mr. Brodie's list.

Coleoptera, of the families Prionidæ, Buprestidæ, Pimelicidæ? Chrysomelidæ? Coccinellidæ?

Buckland.

5. In the Upper Lisa at Dumbarton and Churchdown. (Brodie.)

In the Lower Lisa—are the bone-bed of Aust Cliff, Wainside Cliff, &c. on the Severs; Coombe Hill, Cruachan, Hasfield, Croomwood Hill, &c. in Gloucestershire. (Brodie.)

(Mr. Westwood has examined 300 specimens of insects from the Lisa beds.)

Colespeter's, of the families Buprestidæ? Elateridæ; Curculionidæ or Chrysomelidæ; Carabidæ; Telephoridæ; Melolonthidæ, &c.; a species of Gyrinus.

Orthoptera, including Gryllidæ and Blattidæ.

Hemiptera and Homoptera. Cicadæ? Cimicidæ?

Neuroptera. These are the best determined of the fossil groups, owing to the structures of the wings being clear and characteristic.

Libellula, Brodeiæ (Br.): in Dumbarton, Gloucester. (Brodie.)

Agrion, Buckmanni (Br.), in Dumbarton. (Brodie.)

Aeshna, lissina (Strickland).

Orthoptera, under Stenopina (Westwood).

Hemerothorax Higginsi (Br.).

Chauliodes.

Ephemeræ.

Diptera.

Araia? ignota (Brodie). (Brodie.)

Ephemera.

In the larger beds that the insects are most abundant. They occur in this part (between the ordinary lisa limestone and the bone bed) so extensively as to justify the application of the term "insect limestone," used by Mr. Brodie. As a whole the insect appears to contain larger proportions of aquatic tribes than the Wealden. There is no decided evidence amongst them of the prevalence of a warm climate at the time and in the place of their existence. They are usually of small size, not so entire as to forbid the supposition of having been drifted (the Neuroptera may have been less drifted than the Coleoptera; and if there were islands or high coasts adjacent, these might nourish, and in time of floods send down the small coleopterous insects to be imbedded with the fucoid, oysters, and mollusca of the coasts, and forms of life of the land and streams.)

6. In the ironstone nodules lying in the carboniferous deposits of Coalbrook Dale, Mr. Prestwick has discovered Coleoptera, Curculiidiæ Anactici (Buckl.), C. Prestvici (Buckl.); and Mr. Murchison, Sil. Syst., p. 105, mentions an insect to which the name of Corydalis Brongniartii is assigned. It is very possible that the laminated limestone deposits of Burdie House near Edinburgh and Ashford in Derbyshire may yield insect remains older than any yet met with, and seeing the frequent connexion or proximity of fossil insects to fossil fishes, it may be worth while to search the lower beds of the mountain limestone where the rich fish-beds occur in it, on the Avon, in Clyde Island, and in Forthmagan. The fish-beds of the magnesian limestone (mari slate) may also be indicated for further research. A very interesting addition to the fossil insects of Aix has been made known by M. Coquand. It is a beetle, and has been discovered by Brechelau, who has been able to recognize perfectly its generic and specific characters. It belongs to one of those genera the species of which are not numerous, and are at present confined to the islands of the Indian Archipelago, or the warmest countries of the Asiatic continent. It belongs to the genus Cylo—i.e. an extinct species—and is named C. sepulta. M. Boisdault has examined the other fossil insects of Aix, and differing both from Curtis and from the dissect of Natica, has added them to the extra-European genera, and extinct species.


INSECTS. GEOGRAPHICAL DISTRIBUTION OF.

The various kinds of insects, even when furnished, as the greater number of them are, with powerful organs for flight, are each and all distributed within certain bounds in the most stationary animals or plants. Independence, then, of its great interest as a part of philosophical zoology, the only of the range and specific centres of the forms of insect life becomes of great importance as an aid in the definition of tribes, genera, and species. As yet, however, entomologists have made comparatively little progress in this direction, and have rather occupied themselves in recording the distribution of specimens in cabinets than of species on the earth's surface.

Climate and the extension or form of land are the chief influences regulating the distribution of insect life. The constitution of the soil affects it also, but in a secondary manner, through its influence on the vegetation, on which many insects feed. The influence of the intersection of tracts of waters of mountain barriers, or other causes depending on antient geological events anterior to the origin of the existing fauna of the earth, tracts of land presenting exactly similar conditions of climate and soil are placed far apart, we then have, not a repetition of the same forms among their insect population, but a representation by similar forms. This we see also in the several of the zones of climate, belting mountains at different heights. Man's agency, and the transporting power of currents of wind modify the distribution of many species of insects. In the following brief glance at the distribution of the principal genera of insects, examples of all these influences will be found.

Coleoptera.—From the facility with which insects of this division may be preserved and transported from place to place, the geographical distribution of the species, more than any of the species of other orders. The Coccinellides are dispersed over most parts of the globe, the typical genus being cosmopolitan, whilst other groups are more limited. Among the Curculiidiæ are genera peculiar to Europe, Chlamisæ, Agonus, and Anuros, are common to both hemispheres. Harpalus and Bruchusæ are cosmopolitan. Cerambycæ occur in Africa and Chili. The Carabidæ of Western Asia agree remarkably with those of Europe. Erichson has remarked that Carabi are very constant to certain soils: the vertical distribution of the species is also very constant. The water-beetles allied to Dytiscus, itself universal in the old world; several of the species live in salt or brackish waters. Gyrinus ranges from Northern Europe to New Holland. The Brachyelytra have their chief centre in Europe. The typical genus Staphylinus appears however to be represented everywhere: many species occur in South America. A species of Aleochara is found in Van Diemen's Land. Elater and Destrugas, types of families, are both cosmopolitan; the species are often present in the northern hemisphere, and their distribution depends, in many cases, on that of certain plants on which the larvae prey. Among the fire-flies (Lampyridæ) the genus Lampyris, which is European, is represented in Asia by L. Caeliferus, in Australia, returning to the tropics by L. Bivittatus, and in the New World, by L. Auratus. The Malachi are found everywhere, except in South America. Plinus, a genus chiefly European, has a single representative in Australia. Of the Necrobiidiæ, the genera Cryptophagus, Cryptophasa, and Stenomyia, range from Britain to China, and from Brazil to Lapland. Hister, the type of a family, is also a cosmopolitan genus. Byrrhus belongs to the northern hemisphere, and has its chief centre in Europe. Among the pinnipedia, the genus Aphodius, though represented in most countries, is chiefly developed in temperate regions; whilst Ateuchus, on the other hand, is mainly tropical. Geotrupes is cosmopolitan. Copris ranges to New Zealand, where however it is confined to the north coast. Scarabæus is subtropical. Pelidnota is American. The beautiful Cetonia appear to be of universal distribution. The strange forms of Geolithus are of Northern America. In the south, the cockchafer family, with the species of the South American species in the south, Macroacta and Anoplognatha, confined to Australia; Hoplia, with one exception, European; Ambrosius is Mediterranean; Anisoplia and Serica natives of the tropic regions of the Old World. Of the Sienylida, Helys, is cosmopolitan, Celedinae European. Of the Anthicidae the numerous species of Anthicus are chiefly inhabitants of temperate regions. Geotrupidæ are very generally distributed.

Of the ten thousand species of weevils the great genera Curtephoræ, Cryptorhynchæ, Cylindrus, Othorhynchæ, and Oicles are all cosmopolitan. Platypnsa and Cylobus are South American; Brachyphora, South African and Mediterran- 

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The distribution of the species of weevils depends in a great measure on that of the hosts. The most beautiful and vividly coloured forms of Longicorn beetles are mostly tropical. The presence of forests determines that of many of the genera. Of the seventy genera of Cerambicidae, forty-one are cosmopolitan. Others have defined centres, as *Clytus* in Europe, *Trachydera* in South America.

Of the Chrysomelidae, the typical genus Chrysomela is cosmopolitan. The presence of certain plants determines the distribution of the species. From this cause, species of limited distribution are sometimes multiplied far from their aboriginal habitats. The *Chrysolinae*, introduced from Europe into America, multiplied so at Baltimore in the years 1838 and 1839, that the elm trees of the district were eaten bare by their larves, and probably will they henceforth become a constant annoyance in the New World. *Leucaena* and *Donacia* are instances of cosmopolitan genera having distinct centres in temperate climates. *Casida*, on the other hand, has its centre in the tropics.

Of the *Trimeria*, *Coccinellidae* are found everywhere. *Eumorphus* is Indian and Polynesian.

Orthoptera.—Though by no means an extensive order either as to genus or species, the Orthoptera are of very great importance in the economic history of the regions. *Gryllus* and *Acrida*, the grasshoppers and crickets, are found in most countries. The *Locusta* are mostly exotic. The strange *Phasmus* are mostly tropical, as are also the greater number of the Orthoptera in the islands of the South Seas. *Dysbina* is more widely distributed. *Ommatius*, a genus of *Ascidia*, has its members in all parts of the world. A great many genera are peculiar to South America, and several to Africa, hot, woolly, and moist regions being particularly well supplied with species. *Blatta*, *Blattina*, and *Blattula*, are very general, and have been greatly diffused from their original centres by unintentional human agency. The earwig tribes, *Forficulae*, including more than fifty species, are, in great part, European, but range even to Van Diemen’s Land.

Ericson notices the curious fact respecting the Orthoptera of Van Diemen’s Land, that only one fourth of the species are capable of being winged and capable of flying.

Neuroptera.—The number of known species in this order is short of one thousand. The section of *Phlephenanes* is almost entirely European; the genus *Macronomus*, including species from Madagascar and Brazil, is an exception. The *Plaenophanes*, a great part of the genera of which division are now considered by many naturalists *Orthoptera*, have a much more varied distribution. Thus the *Myrmeloneuridae* are cosmopolitan, the *Perla* and *Nemoura* chiefly European, the *Pentatoma* characteristic of the temperate regions of both the old and new world, the *Termes* of the tropics. In the section of *Subhelicornia*, the *Ephemerae* are European; the *Ascalaphidae*, cosmopolitan; as also the true dragon-flies, *Libellulae*, of which near two hundred species are known. Other allied genera are more limited.

In looking among the sting-bearing species, the true bees are characteristic of the ancient continent, those now dispersed in America having been transported from Europe. The genera *Centris* and *Eucoilus* are exclusively American. *Nomia* is Asiatic. *Alloxylo* is south African. *Androctonus* and *Xylocopa*, and several other extensive genera, are cosmopolitan. A great many genera of wasps are peculiar to South America. The ants are most developed in Europe. *Bembix* is a tropical genus. The teretebrating *Hymenoptera* are both very numerous and widely distributed, especially the great genus *Ichneumon*. Certain genera forming the family *Oxytera* are exclusively European, as are also a great part of the numerous family of *Chalcidinae*. *Cynips* is European, and the greater number of *Tenthredinidae*.

The distribution of the Strepsiptera depends on that of the insects on which they are parasitic.

The distribution of the butterflies shall have been worked out, it will doubtless prove very interesting. At present our knowledge of this subject is imperfect. The *Papilionidae* are very numerous specifically, and far outstrip the *Coccinellidae*. Some of them possess great ranges. Thus certain species of *Pierca* are found over all Europe, and great part of Asia and Africa. Other forms are restricted to mountainous regions. Of the *Nymphalidae* the great number of species are tropical, and in this family there are some remarkable instances of extensive distribution of species. Thus *Vanessa Cardui* (a common British butterfly) is found in every part of the world, and *Vanessa Atalanta* ranges over Europe, Asia and Africa, and to North America. In the remaining tribes the typical genera are almost always cosmopolitan, whilst others have more limited areas.

The *Selysiana* and *Zyginae* are in great part European; the *Cardinalinae* mostly tropical.

Among the moths, the *Phalinae* are chiefly European, and the species are usually widely distributed. This appears to be the same with the other families of Nocturnal Lepidoptera, probably rather in consequence of one, or the other, of the known knowledge of exotic forms, than because it is really so, for we find types and species in distant regions wherever they have been introduced. *Cossinae*, introduced from Asiatic Russia, where the researches of Eversmann among these insects have brought many new forms to light.

Diptera.—One-half of the described species of two-winged flies (above those of the Coleoptera) are introduced from Europe. This disparity proportion arises from our comparative ignorance of the exotic forms. The small group of *Omnithomyzae*, parasites on quadrupeds and birds, has representatives of all its genera in Europe, the few remaining species being natives of eastern Asia, Western Africa, Australia, or Brazil. The flies forming the family of *Musciae* include a great number of genera, both European and exotic, the former being most prolific in species, some of which have wide ranges. *The Sphingidae* are in the same category. The genus *Chrysopea*, equally developed in Europe and America, and represented in a less degree in Africa and Asia, does not appear in Australia nor in the islands of the South Seas. *Dysbina* is more widely distributed. *Ommatius*, a genus of *Ascidia*, has its members in all parts of the world. A great many genera are peculiar to South America, and several to Africa, hot, woolly, and moist regions being particularly well supplied with species. The number of the numerous and varied forms in most parts of the world, is excluded from Australia and the Pacific, which region seems to be the least prolific in *Diptera*. *Culex* is very generally distributed.

Hemiptera.—Of the two great divisions of this order, the *Hemipterae* and the *Heteroptera*, the first is the smallest and also the most tropical. The distribution of the insects comprising these depends mainly on the fauna and vegetation of the countries they inhabit. Thus each species of *Coccus* aphids is with a range correspondent to that of the plant upon which it feeds; and of the *Corvidae* and *Leptopidea* with the presence of their favourite animal food. Among the most interesting of the families of *Hemipterae* are the *Cicadeae*, of which the genus *Tettigonia* includes 200 species, centred in America, but having members also in the Old World; the *Pulicidae*, or Dancing-flies, very generally distributed throughout warm climates; *Scutelleridae*, remarkable for brilliancy, and mostly equatorial; and *Cimex*, of which the only true species is the common bed-bug, a pest spread over all Europe. Of the Aquatic *Hemipterae* *Gerris* and *Nepa* are cosmopolitan; *Pelecusa* and the *Nectonectidae*, mostly European; *Galbulus* and *Monomyzae*, American; and *Holobates*, equatorial.

Thysanura.—The species of the order of this curious group of insects has been scarcely attended to. The species of *Lepisma* range from Europe to China. *Padura* and *Smyrthaea* are European; a single species of the last-named genus occurs in North America.

Anoplura.—These disagreeable parasites have lately been honoured by the attention of some excellent naturalists, especially Denny and Gwilt. Their distribution corresponds with that of the animals upon which they are found. The equally annoying order *Apothameptera* three-fourths of the known species are European. The common flea is a cosmopolitan, and the Chigo is confined to South America.

IN SOLVENCY. From August, 1843, to August, 1845, three acts have been passed relating to insolvent debtors; these are 5 & 6 Vic. c. 116; 7 & 8 Vic. c. 96; and 8 & 9 Vic. c. 127.

The acts of & 6 Vic. c. 116, which came into operation 1st November, 1842, enabled a person who was not a trader within the meaning of the bankrupt laws, or a trader who owed debts which amounted in the whole to less than 300L., to obtain for petitions protection from creditors. The commissioners of the Court of Bankruptcy in London or the Commissioners of the District Courts of Bankruptcy in the counties, from all process whatever (except under the judge’s order), either against his person or property until the hearing of the case. The principle was, that the insolvency’s property was vested in an official assignee appointed by the court. If, on the hearing of the petition, the commissioners were satisfied with the allegations which it contained, and that the debts were uncollectible, breach of trust, or by any proceedings for breach of the laws,
he was empowered to make a final order for the protection of the petitioner from all process, and to cause his estate and effects to be sold and disposed of to any assignee chosen by the creditors.

The act 7 & 8 Vict. c. 96, passed 9th August 1844, is entitled 'An act to amend the law of Insolvency, Bankruptcy, and Civil Procedure in Bankruptcy.' It may be remarked as an act upon judgment in an action for debt, who was not a trader, or whose debts, if a trader, were under 200l., may, without any process or issue, by petition to a bankruptcy court, be protected from arrest and from being detained in prison for any debt mentioned in his schedule; and if so detained, the commissioners of any bankruptcy court may order his discharge.

The property of the insolvent may be seized for the benefit of his creditors with the exception of the wearing apparel, bedding, and other necessaries of the petitioner (the insolvent under 7 & 8 Vict. c. 96) and his family, and the working tools and implements of the petitioner not exceeding in the whole the value of 20l. Under the 7 & 8 Vict. c. 96 (§ 39) if a petitioner for protection from process (pursuant to the provisions of that act) shall wrongfully and fraudulently omit in the schedule, which schedule he is required to make (§ 6 & 7 Vict. c. 116), any property whatever, or retain or exempt out of such schedule any wearing apparel, bedding, or other necessaries, in priority of any debt over 20l., he shall, in default of conviction, be liable to be imprisoned and kept to hard labour for any period not exceeding three years.

The 7 & 8 Vict. c. 96, made a great alteration as to debts under 20l., and also relieved many small debtors who were in debt and not in circumstances to pay; for it is expedient to limit the present power of arrest upon final process, be it enacted, that from and after the passing of this act, no person shall be taken or charged in execution upon any judgment obtained in any court of ducy's superior court, or in any county court, court of requests, or other inferior court, in any action for the recovery of any debt wherein the sum recovered shall not exceed the sum of 20l. exclusive of the costs recovered by such judgment. The 56th section provided that upon application to a judge of one of the superior courts of law at Westminster, or to the court in which such judgment was obtained, any judgment shall not be taken in execution against the property of the debtor, just as they might have had if he had never been taken in execution upon such judgment. The 56th section gave to the judge who should try such cause (§ 58), the power either of discharge or of imprisonment for the time to the court of the barister or attorney at law, power to imprison the defendant (debtor) for such times as are mentioned in § 58, if he should appear to have been guilty of fraud in contracting the debt, or had contrived it under the other circumstances mentioned in the 56th section.

The amount of debts in England and Wales under 20l., must always form a very considerable proportion of all the debts that are at any time due in the United Kingdom. Such debts comprehend a large part of the dealings of shopkeepers and petty traders; probably in a very large number of cases debts under 20l., for every one comprehends every debt that is due to a large body of petty traders. Those debts should do in many cases give credit to persons who have no means of payment, and with whose character and condition they are very imperfectly acquainted. Many persons always being willing to extend a debt, but never being able to pay if they can help it. Another class of debtors consists of those whose morality is not so well fixed as to make them good and willing to pay, which takes the jurisdicition of the courts of equity. To all of these classes of debtors, some influence of some feeling of honesty and some fear of the consequences of non-payment. A third class, which we hope may be the most numerous of all, is willing to pay, but often is deprived of the means of payment if they cannot command the credit which their character and earnings fairly entitle them to. [Creditor, P. C. S.]

The 57th and 58th sections of the 7 & 8 Vict. c. 96, deprived creditors of their hold upon their debtors for sums under 20l., and left to all persons who had claims upon persons under 20l., the right of prosecuting their debtors there. As to debts under 20l. existing before the act, and for which the debtor was not in execution, it left the creditor no remedy except against his property. And here let it be remarked that the amount of debts under 20l. is so small that the insolvency of creditors seems reducible within narrow limits, if we view it merely as it affects the interests of the community. The object in allowing a debtor to be set free from the punishment of being held as a debtor, but that he may be subjected to a considerable punishment for the purpose of discovering what his property is, that he has not parted with it to defraud his creditors, and that there was no fraud in the contracting the debt. For the simple fact of being indebted and unable to pay should not be punished. The contracting debtors under such circumstances as amount to fraud ought to be punished. The principle then which should guide a creditor should be, not to punish a man simply because he is indebted and cannot pay his debts, but to punish him for any fraud that is committed either in contracting the debt or in attempting to evade the payment of it. Now in the case of a debtor, fraud, both in contracting a debt and in attempting to evade payment, is known by experience to be a thing of frequent occurrence; and it is therefore just and reasonable that judgment creditors should have the power to secure the person of their debtor until he be held to have made a full and honest statement of his means of payment.

The effect of the last-mentioned act was of course to diminish the credit given by small dealers to all persons. The act 7 & 8 Vict. c. 96, relating to small debts, had also relieved many small debtors who were in debt and not in circumstances to pay, for it is expedient to limit the present power of arrest upon final process, be it enacted, That from and after the passing of this act, no person shall be taken or charged in execution upon any judgment obtained in any court of ducy's superior court, or in any county court, court of requests, or other inferior court, in any action for the recovery of any debt wherein the sum recovered shall not exceed the sum of 20l. exclusive of the costs recovered by such judgment.

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or by the creditor if he think fit, 'touching the manner and time of his contracting the debt, the means or prospect of payment he then had, the property or means of payment he still hath or may have, the disposal he may have made of any property since contracting the debt.' The commissioner is empowered to make an order on the debtor 'for the payment of his debt by instalment or otherwise; and if the debtor fails to attend or to make satisfactory answer, or shall appear to have committed any fraud in the commission of the debt, or if he have wilfully contracted it without reasonable prospect of being able to pay it, or to have concealed or made away with his property in order to defeat his creditors, the commissioner or any of them may make an order for the payment of the debt, or for the seizure of the whole or a sum not exceeding $20 in value, are exempted from seizure. The powers of all inferior courts under this act are assimilated; and a suit commenced in one small debt court cannot be removed to another, like suits in the same town. When a debt exceeds $20, the suit may be removed by certainiri to the superior courts. Any of her Majesty's secretaries of state are empowered to alter or enlarge the jurisdiction of all small debts and inferior courts. The act itself enlarges the jurisdiction of courts of requests, where sums not exceeding $20 could heretofore only be recovered, and now sums not exceeding $20 may be recovered in courts of request, as well as courts of record. All suits most be paid into court and not claimed for six years is to go into a fund for the payment of the necessary expenses of carrying on the business of the court.

3. 'The Securities, sect. 70, which came into operation 1st September, 1844, and is entitled 'An Act for facilitating Arrangements between Debtors and Creditors,' is of the nature of an insolvent act. Under this act a debtor who is not subject to the bankruptcy laws may apply by petition to a court of bankruptcy and obtain protection from arrest, provided his petition be signed by one-third in number and value of his creditors. The debtor's petition must set forth the cause of insolvency of those creditors, and a description of the property for the future payment or the compromise of his debts, and a statement of his assets and debts. Any one of the commissioners of bankruptcy may examine the petitioning debtor, or any creditor who may join in the petition, or any witness produced by the debtor, in private; and if he be satisfied with the statements made, he may convene a general meeting of all the petitioners' creditors, and appoint an official assignee, registrar, or a creditor to report the proceedings. If at the first meeting the major part of the creditors in number and value, or nine-tenths in value, or nine-tenths in number of those whose debts exceed $20, shall assent to the proposition of the debtor, the compromise is to be approved by three-fifths of the creditors present in number and value, or nine-tenths in value, or nine-tenths in number of those whose debts exceed $20, to agree to the arrangement made. If the arrangement made fails of being effectual and reducing the debts to less than $20, the creditors shall be divided among, the several creditors, provided such resolution shall be binding, provided one full third of the creditors in number and value be present. Under this arrangement the affairs of the debtor may be settled. When this has been effected, a meeting of the creditors is to be held before the commissioner, who is to give the debtor a certificate, which shall operate as a certificate under the statute relating to bankrupts.

The regulations of the 7 & 8 Vict. c. 96, as to debts under $20, caused universal dissatisfaction among creditors in England and Wales, as we have already observed. The evidence taken by the Committee of 1841 proved the necessity of amending this act. The history of this subject shows the unwise legislation and of its correction is useful. It shows how ill-considered measures may sometimes become law in the heat of the moment. Whether the mass of public business is so enormous that important statutes are sometimes enacted without due deliberation. It also shows that the force of opinion, when sustained by sound reasons and directed by men of judgment, is not strong enough to induce the legislature to amend their mistakes.

The law of debtor and creditor has been a difficulty in all countries. In England an insolvent debtor may, in certain cases, be protected from the operation of the law. If he cannot claim the benefit of the bankruptcy laws, he is subject to the law that relates to insolvent debtors. The question of arrest and imprisonment for debt has been chiefly discussed with reference to insolvent debtors, that is, the class of debtors whose debts have not been contracted in the operations of trade or commerce, or under such circumstances as to bring them within the bankruptcy laws.

Formerly there were two kinds of arrest in civil cases, that which took place before trial, and was called arrest on mesne process; and that which takes place after trial and judgment, and is called arrest on final process. In the arrest on mesne process it was only necessary for the plaintiff to make an affidavit that the defendant had made away with his property, or that he had committed any fraud in the commission of the debt, which was to be proved by the sheriff, who thereupon gave his officers a warrant for seizing the debts of the creditor. The statute 5 & 6 Vict. c. 110, § 85 enacted that no one person can be arrested for alleged debt before a judgment has been obtained against him, unless it can be shown to the satisfaction of a judge of one of the superior courts that the plaintiff has a cause of action against such person to the amount of $20 or upwards, and that there is probable cause to believe that the defendant is about to quit England. A defendant also be arrested upon mesne process when he has received an unfavourable judgment in the court for the relief of insolvent debtors (1 & 2 Vict. c. 110, § 85).

Arrest in execution is therefore now the only arrest that is of any practical importance: it means the arresting of a man after a court of justice has decided that he owes a debt. The ground of arresting the man is, that he does not pay the debt pursuant to the judgment; in other words, he disobeys the order of the court. "Every defendant is bound that he must pay a certain sum of money to the plaintiff." On the subject of maintaining the law of arrest in execution there has been difference of opinion. The best arguments in favour of arrest in execution have been advanced by the Supplementary Paper on Bankruptcy and Insolvency, by William John Law, Esq., Dissenting from the Report. Presented to both Houses of Parliament, 1841. Mr. Law did not sign the report of the other commissioners on the subject because he did not agree with them; and the Supplementary Paper contains the reasons of his dissent.

With respect to arrest in execution, Mr. Law's intimate acquaintance with knowledge on the subject has enabled him to answer fully all the arguments of those who attempt to show the insufficiency of this final arrest. He has proved beyond doubt the justice of this final arrest, or if the word justice be objected to, its usefulness to the community. A man is not now arrested till he has disobeyed the judgment of a court of justice. It is his business to show why he disobeyed the judgment; and in the mean time either his person must be secured, or the judgment of the court created as a mere idle form. It may be said, the plaintiff can proceed to take the debtor's property; but even visible property cannot always be got at; when the sheriff goes to seize it, "some of the creditors generally precede him to the market, the bills of sale, and frighten him out again; there is not one plaintiff in five hundred, great or small, who has courage enough to indemnify the officer, and defy the fraud. If there is no visible property, the debtor's right to whatever is his; what must be the difficulty of getting at the property of the debtor which is not visible? And what other mode can be suggested of compelling the defendant to give a true account of all his property than to imprison him until he does? 'A defendant has always been prone to place his property out of reach of an execution, but there has been this one restraint: he says to himself, "If I make my property safe, they will take me, and then I must bring it forward." When property only can be touched, the argument is changed; it becomes this: "If I make my property safe, my enemy can do nothing." So necessary is process against the person of the party against the property, and unanswerable is it to require of the creditor by record the establishment of any further case, in order to entitle him to an execution. The judgment is a question more of the creditor's right, and the property of the other party to establish his exemption from the task of satisfying it." The great argument of the Report from which Mr. Law dissenting has been that all executions suppose fraud. This argument is very absurd. The presumption ought to be against the debtor who does not obey the judgment of the court. He may be guilty of fraud or no. He may not have the means to pay the debt, or may have committed the bankruptcy fraud, or there may be no evidence in the order of the court. This argument against execution is founded on the presumption being in the debtor's favour, instead of being, as it is, against him. 'The practical justice and wisdom is in subjecting all (debtors) to searching inquiry,
for the purpose of ascertaining whether they are dishonest or not. I am quite sure that in that court (the Insolvency Court) it is always found necessary to be applied to every case as the means of disclosing its true character and merits.\(^1\)

1 Blamelessness must not be presumed: faultiness is to be presumed and not to be negated by the word fraud; the precise shade cannot be presumed; the character and degree are to be learned through a deliberate and forced inquiry. It is misrepresentation to say that fraud is presumed and that the power of the coercion which was once purely punishment is now necessary coercion to the investigation of a question in which presumption is and ought to be against the party coerced. The debtor in execution is the applicant for discharge and for his own case, but he is at liberty to institute proceedings towards this question instantly on his arrest; and not only is he at liberty to seek exemption from the consequences of the injury which he has done to the particular party who has pursued him, but he is allowed by law to use the same opportunity for acquiring a privilege against every person in the kingdom towards whom he stands in a similar predicament; on giving to the true owner a part of their property and obtaining by that means the consent of the person to surrender, he receives, if excuse is found for granting it, this great boon—a total freedom for the future of person and property; save that if ever he become in the full and fair sense of the words of ability to pay, there will reside in a competent tribunal the power to ascertain that ability and to exact that payment.

It is almost unnecessary to say that these results ought not to be enjoyed without that full disclosure of the history of his property which is found in the schedule of an insolvent debtor: that full opportunity for the creditors to challenge this history; and that fair, deliberate, and effective investigation of its truth which is made in that court.

These general arguments in favour of the justice of final execution are supported by Mr. Law with facts equally strong, which also prove the efficacy of such arrest. The mode in which he has examined the arguments in favour of abolishing arrest, which are derived from certain returns, is completely convincing. The efficacy of arrest must not be estimated by the extent of dividends made in the insolvent debtors' Court, or the proportion of unfavourable judgments;\(^2\) though it must be remembered that the dividends are not at all, as some people suppose. It is clearly shown by Mr. Law that arrest does make people pay, who do not pay till they are arrested; it is found that the examination to which insolvents are subjected expels the great amount of fraud; and it is also certain that the number of those who are induced to pay by the fear of arrest is considerable, just as the fear of other punishments prevents many persons from committing crimes, who have no other motive to desist from them. The fear of arrest is precisely that preponderating weight which is wanted to induce those whose honesty is wavering to incline to the right side.

The arguments of Mr. Law should be read by every man who wishes to form a sound judgment on the mode of insolvent debtors in England; and so much of his arguments as have been here given, may help to diffuse some just opinions on a subject in which a sympathy with debtors, to the total forfetment of creditors, has led many well-meaning people to adopt conclusions that tend to unsettle all the relations of society, and to confound honest men and rogues. Some valuable observations on the laws relating to imprisonment for debt by Mr. Commissioner Fane are printed in 'The Banker's Magazine,' No. xix., October 1845. He concludes 1st, That the remedy given to creditors by the seizure of goods under a fieris factis (Fieri Facias, P. C.) is a delusive remedy; and 2nd, That such remedy, instead of being beneficial to the creditor, whom it is intended and supposed to assist, actually prejudices him, by enabling the debtor more effectually to cheat him under the law of form; and, therefore, so far as relates to this branch of the subject, the power which each creditor now possesses of seizing his debtor’s goods under a fieris facias for his own exclusive benefit, is a mischievous power which ought to be abolished.

INSURANCE. MARINE. [MARINE INSURANCE, P.C.]

INTEGRATION. In the article INTEGRAL CALCULUS, P. C., the meaning of an integral was explained. The present article is the operation of integration, that is, of finding the primitive function which has a given function for its differential coefficient. Having given P a function of x required Q so that dQ/dx may be P. In the article QUADRATURES, METHOD OF, P. C., is given the mode to which we must have recourse, in order to find particular values of Q, when the general methods for determining it fail. In this article we confine ourselves to what is most useful in operation, as a summary for the advanced student, not an explanation for the learner. Properly speaking, the problem requires some addition to make it definite. Thus 2x has x for a primitive function, and also x²+4 C being any constant quantity whatever. In the present article, we shall neglect this constant altogether, reminding the reader that he must never omit it in any application. If he should refer to different books different functions given as the primitives of one and the same function, he will always find that those different primitives differ only by a constant quantity. Thus \((1-x)⁻¹\) and \(x(1-x)⁻²\) both occur as the primitive of \((1-x)⁻²\); but they only differ by a constant, namely 1.

In the common process of integration, the actual passage from the differential coefficient to the primitive is always an act of memory. The algebraical work which occurs is always used either to reduce a form in which memory will not serve into one in which it will, or else to reduce the given differential coefficient to two terms, one of which can be integrated by memory, and the other of which is more simple than the original quantity.

The functions in which the simple remembrance of the forms of the differential calculus is of use are as follows:

\[
\int dx = x, \int dx dx = \frac{x^{n+1}}{n+1}, \int \frac{dx}{\sqrt{x}} = 2x, \int \frac{dx}{x^2} = \log x, \int \frac{dx}{x^a} = \frac{x^{a-1}}{a-1}, \int x^n dx = \frac{x^{n+1}}{n+1}, \int \frac{x^n}{x^a} dx = \frac{x^{n-a}}{n-a}, \int \frac{dx}{\sqrt{1-x^2}} = \sin^{-1} x, \int \frac{dx}{\sqrt{1-x^2}} = \cos^{-1} x, \int \frac{dx}{1+x^2} = \tan^{-1} x.
\]

To these should be added the following, which may be obtained in various ways from the methods of this article, or from peculiar articles which are found in works on the subject.

\[
\int \frac{dx}{\sqrt{x^2-a^2}} = \sin^{-1} x, \int \frac{dx}{\sqrt{a^2-x^2}} = \log \left( x \pm \sqrt{a^2-x^2} \right), \int \frac{dx}{\sqrt{x^2+1}} = \log (x + \sqrt{x^2+1}), \int \frac{dx}{\sqrt{x^2-a^2}} = \log \left( x \pm \sqrt{x^2-a^2} \right), \int \frac{dx}{\sqrt{x^2+1}} = \log \left( x + \sqrt{x^2+1} \right), \int \frac{dx}{\sqrt{x^2-a^2}} = \log \left( x \pm \sqrt{x^2-a^2} \right), \int \frac{dx}{\sqrt{x^2+1}} = \log \left( x + \sqrt{x^2+1} \right).
\]

Among the peculiar articles of integration may be reckoned the following, which are perhaps nearly all that can be useful to a learner:

1. The reduction of such a form as \(xf dx\) to another form \(f'vdx\), in which \(v\) is a different variable. Thus \((x+a)x^n dx\) can be immediately reduced to \(x^n(a+x^n)(a+nx^2)\) or \(f'vdx\), where \(v\) means \(a^n-a^2\). The second form is immediately seen to be integrable. Cases of this kind are so various that the student must form the habit of looking for them, and recognizing them at sight, as the integration of \(x^n\) of a slight transformation is required, thus: \((1-x^n)x^n dx\) when reduced to \((x^n+1)x^{n+1} dx\) clearly shows the form \(-x^n dx\), where \(v\) is \(x^n-a\).

2. The reduction of algebraical to trigonometrical functions, and the converse. Thus \((x-a)^n x^n dx\), when reduced to \((x-a)^n x^{n+1} dx\) clearly shows the form \(-x^n dx\), where \(v\) is \(x^n-a\).

3. When rational powers appear in a denominator, they...
should be transferred to the numerator by changing \( x \) into \( 1/z \). By such a transformation, we change

\[
\frac{dx}{x^{m-1}} \to \frac{z^n \cdot 1}{\sqrt[2]{(a+bx+cz^2)}},
\]

4. When an irrational root of a polynomial appears in the numerator, it should generally be transferred to the denominator: thus, \( \sqrt{X} \ dx \) should be written \( X \ dx \). By such a transformation, we change

\[
\frac{\sqrt[2]{(a+bx+cz^2)} \ dx}{\sqrt[2]{(a+bx+cz^2)}},
\]

6. When, by the addition of more simple terms to the numerator, it can be made the differential of the predominant function of the denominator, such additions, with compensating subtractions, will frequently reduce the question of integration to a more simple one. Thus we alter

\[
\frac{ax}{\sqrt[2]{(a+bx+cz^2)}},
\]

7. The last mode of proceeding, it is best to form, in general terms, an equation of reduction, as it may be called, which furnishes the key to the reduction of each case to the one below it. Thus if \( f(x) \ dx \) be considered as a function of \( n \), and called \( V_n \) integration by parts gives

\[
V_{n+1} = -\frac{e^{-x^2}}{2n} + \cdots + \int dx^n,
\]

7. In the last mode of proceeding, it is best to form, in general terms, an equation of reduction, as it may be called, which furnishes the key to the reduction of each case to the one below it. Thus if \( f(x) \ dx \) be considered as a function of \( n \), and called \( V_n \) integration by parts gives

\[
V_{n+1} = -\frac{e^{-x^2}}{2n} + \cdots + \int dx^n,
\]

8. The use of the equation of reduction depends upon our being able at last to reduce the question to that of finding a visibly known integral. Thus, if in the preceding \( n \) be an integer, we must come to \( f(x) \ dx \), or \( f(x) \ dx \), which is known. But if \( n \) were a fraction, no reduction of the value of \( f(x) \ dx \) at a time would lead to an integrable form.

9. The integrable form at which we arrive by successive reductions is called the ultimate form. It frequently happens however that the reductions proceed by two or more steps at a time, in which case two or more ultimate forms result. For instance

\[
V_n = \frac{x^n \cdot \sqrt[2]{a+bx+cz^2}}{n},
\]

Accordingly, when \( n \) is even, we are brought at last to \( V_n \), and when \( n \) is odd, to \( V_n \), or to \( \sin^{-1}(x) \) and \( -\sqrt[2]{a+bx+cz^2} \).

10. In using equations of reduction, it will be found more convenient to work upwards from the ultimate form to the case required, than in the contrary way. Thus if we want

\[
V_1 = \int f(x) \ dx,
\]

We should proceed as follows:

\[
V_0 = a, \quad V_n = x^2 - a^2,
\]

11. There are several cases in which the following extension of the theorem known by the name of John Bernoulli may be used. Let \( \alpha, \beta, \gamma, \delta \) be the successive differential coefficients of \( u \) with respect to \( x \), and let \( v_1, v_2, v_3 \), &c. be the successive integrals of \( w \) with respect to \( x \): then

\[
\text{fwdw} = \mu_{1} \cdot v_1 \cdot w + \mu_{2} \cdot v_2 \cdot w + \cdots + \mu_{n} \cdot v_n \cdot w + \cdots + \mu_{n} \cdot v_n \cdot w + \text{fwdw}.
\]

This is particularly useful when \( u \) is a rational and integral function, and \( v \) is successively integrable with ease, as when \( u = e^{x} \), \( \sin ax \), or \( \cos ax \). The process can then be continued until the remainder vanishes.

12. In the case of \( \text{fwdw} \), where \( \alpha, \beta, \gamma \) are rational and integral functions, the integration is always possible as soon as all the roots of \( \alpha \) are found. The process in Fractions Decomposers or, P. C. S., must be applied. When this is done, and the function thereby reduced to the sum of terms of the form \( A(x - a)^{-n} \), the integration gives no trouble.

13. In the case of a pair of irrational roots, \( \alpha, \beta \), \( \lambda, \mu \), each occurring once, the sum of the terms which they produce can be reduced to the form

\[
\int (A + B \cdot x) \ dx \ \mid (x - a)^{-n} \]

the integral of which is

\[
\frac{B \cdot A - A \cdot B}{\lambda - \mu} \int \frac{1}{x - a} \ dx.
\]

14. When \( \text{fwdw} \) is a function of powers of any one case of \( ax+b \), it can, if irreducible, be reduced to a rational function by assuming \( ax+b = w \), when \( m \) is the least common multiple of all the denominators in the exponents. For \( dx \) becomes \( m \cdot dx/a \), and every power of \( ax+b \) becomes an integral power of \( m \).

15. The function \( x^n (ax+b)^{r} \cdot dx \) can be integrated when either \( m \) or \( n \) is a positive integer: when \( m \) is an integer, by simple expansion; when \( m \) is a fraction, but not \( n \), by making \( ax+b = w \), and substituting. But when both \( m \) and \( n \) are negative integers, let \( z = 1/y \), and after substitution, make \( a+b = w \), and substitute for \( y \).

16. The function \( \text{fwdw} \) can be easily integrated by decomposition of fractions, the denominator never having equal roots. The same may be said if we substitute \( x^2 + 2ax + a^2 \) for \( \alpha \).

17. In \( x^n (ax+b)^{r} \cdot dx \) we have an integrable function, whenever either of the following is a positive integer:

\[
\frac{r+1}{s} \text{ or } \frac{r+1}{s} + t.
\]

The substitutions which succeed in the two cases are

\[
a + bx = \frac{e^{-x^2}}{2n} + \cdots + \int dx^n,
\]

\[
\delta \text{ being the denominator of } t.
\]

18. The following transformation involves a large number of obvious cases, and is constantly occurring. If \( \text{fwdw} \), then \( \text{fwdw} = \text{fwdw} \), and does not put \( \text{fwdw} \) into \( \text{fwdw} + \alpha \). Thus in no list would \( \text{fwdw} \) be put down, after \( \text{fwdw} \) has been given.

19. The following integrals are worth giving separately as ultimate forms:

\[
\int \frac{dx}{x^n} = \frac{1}{a} \ \cos^{-1} \frac{a}{x},
\]

\[
\int \frac{dx}{\sqrt[2]{(a+bx+c)^2}} = \frac{1}{a} \ \log \left( \frac{a+x}{a+bx+c} \right),
\]

\[
\int \frac{dx}{\sqrt[2]{(a+bx+c)^2}} = \frac{1}{a} \ \log \left( \frac{a+bx+c}{a-x} \right),
\]

\[
\int \frac{dx}{\sqrt[2]{(a+bx+c)^2}} = \frac{1}{a} \ \log \left( \frac{a+bx+c}{a-x} \right),
\]

\[
\int \frac{dx}{\sqrt[2]{(a+bx+c)^2}} = \frac{1}{a} \ \log \left( \frac{a+bx+c}{a-x} \right),
\]

the integrals which come under one or another of three previously given forms, according as \( b - 4ac \) is positive, nothing, or negative.
\[ \int \frac{dx}{\sqrt{(a+bz-x)^2}} = \frac{1}{a} \sin^{-1} \left( \frac{2bz-a}{\sqrt{a^2+b^2}} \right) \]

\[ \int \frac{dx}{\sqrt{a^2+x^2}} = \frac{1}{a} \sin^{-1} \left( \frac{x}{a} \right) \]

Let \( X = (a+bz-x) \).

Then \( \int \frac{dx}{\sqrt{aX+bx^2}} = \frac{1}{a} \sin^{-1} \left( \frac{bx-a}{\sqrt{a^2+b^2}} \right) \).

\[ \int \frac{dx}{\sqrt{a+bz-x}} = 2 \int \frac{dx}{a+bz-x} = \frac{1}{a} \log \left| \frac{a+bz-x}{a} \right| \]

29. All that it remains to give are the equations of reduction for remarkable cases. Many other differentials can be integrated in a finite form: but it is impossible to give a list of all which are sometimes useful. The transformation of unknown to known forms is one of the most necessary studies of the young mathematician.

Let \( V_{m,n} = \frac{1}{\pi} \int_0^{\pi} f(x) \sin^m x \cos^n x \, dx \).

Then \( V_{m,n} = \frac{1}{(2\pi)^{m+n+1}} \int_0^{2\pi} f(x) \sin^m x \cos^n x \, dx \).

29. Instead of giving a large number of forms which are all derivable from (29.), it will be better to give an instance of the derivation in full. Let the case be \((a+bz-x)^2 \int dx \), and let the formula be required to reduce both \( m \) and \( n \) in numerical magnitude. Here, to transform the formula in (29.)

For \( m \) write \( -m \); retain \( n \).
For \( A \) write \( 2A \); for \( B, -1 \).
For \( a,c \) write \( 1,2 \).
For \( g_1 \) write \( -m+1-n \); for \( h, -m+1+n \).
For \( x \) write \( -1 \).

The first formula becomes \((P \text{ being } 2ax-x^2)\)

\[ (2a-m+n) \int (m-n)(n-m-2m-1) = \int \frac{dx}{\sin^m x \cos^n x} \]

from which, writing \( V_{m,n} \) for \((-m,n) \) or \( \int dx \), we have

\[ V_{m,n} = \frac{1}{(2\pi)^{m+n+1}} \int_0^{2\pi} f(x) \sin^m x \cos^n x \, dx \]

If it were required to reduce \( n \) in the preceding without altering \( m \), throw the formula \( \int \frac{dx}{\sin^m x \cos^n x} \), into the form \( \int \frac{dx}{\sin^{m-n} x \cos^n x} \) and use the first of the four formulae.

All the preceding formulae involving \( \tan^p \), are particularly in use when \( n \) is a fraction, positive or negative, with the denominator 2. Those in fact form the most usual cases. Formulae involving \( \sin^p \) or \( \cos^p \) are of little use, that they are better omitted in a work in which space is of importance.

31. The following equations of reduction are those which are most commonly used:

\[ \int \frac{dx}{\cos x} = \frac{\sin^{-1} x}{x} \]

\[ \int \frac{dx}{\sin x} = \frac{\cos^{-1} x}{x} \]

\[ \int \frac{dx}{\cos^n x} = \frac{1}{n-1} \frac{\cos^{n-1} x}{x} \]

\[ \int \frac{dx}{\sin^n x} = \frac{1}{n-1} \frac{\sin^{n-1} x}{x} \]

\[ \int \frac{dx}{\sin^m \cos^n x} = \frac{1}{m-1} \frac{\sin^{m-1} \cos^{n-1} x}{x} \]

\[ \int \frac{dx}{\sin^m \cos^p x} = \frac{1}{m-1} \frac{\sin^{m-1} \cos^{p-1} x}{x} \]

\[ \int \frac{dx}{\sin^m \cos^p \sin q x} = \frac{1}{m-1} \frac{\sin^{m-1} \cos^{p-1} x}{x} \]

\[ \int \frac{dx}{\sin^m \cos^p \cos q x} = \frac{1}{m-1} \frac{\sin^{m-1} \cos^{p-1} x}{x} \]

\[ \int \frac{dx}{\sin^m \cos^p \tan q x} = \frac{1}{m-1} \frac{\sin^{m-1} \cos^{p-1} x}{x} \]

\[ \int \frac{dx}{\sin^m \cos^p \cot q x} = \frac{1}{m-1} \frac{\sin^{m-1} \cos^{p-1} x}{x} \]
32. We have given the last steps in various forms, because in all the integrals of the form \( \int x^m (a-x)^n \, dx \) depend upon them. For \( x = a \sin \theta \), the last integral becomes 
\[ -a^{m+n+1} \sin^{n+1} \theta \cos^n \theta \, d\theta. \]
We have now given most of the forms which will be useful in an ordinary work of reference. Further forms and examples will be found in many works on the integral calculus, but the largest collection is in Miller Hirsch's "Integral Calculus," Berlin, 1910, etc., a work of which there is also an English edition.

We have omitted notice of a great many such forms as \( \int x^n a^n x^k \cos x^n \, dx \), etc. which are little used, except in particular cases. When \( \int x^n a^n x^k \cos x^n \, dx \) can be integrated, it follows that \( x^n a^n \cos x^n \, dx \), can also be integrated, since the second can be made into the sum or difference of two functions of the first form, by putting for \( \cos bx \) or \( \sin bx \) their exponential values.

The question of the possibility of integration in finite terms can often be settled by the following theorem:---Integration and differentiation, with respect to different variables, are convertible operations, thus 
\[ \frac{df(x,y)}{dx} = \frac{dy}{dx} \frac{df}{dy} \]
If therefore \( f(x) \) can be found, so also can \( f(x,y) \) by differentiation.

Functions involving the transcendental forms \( \sin phi x, \cos \), etc. can sometimes be reduced to more algebraical forms by integration by parts. Thus,
\[ \int (V \sin X \cdot x = \int V \sin X \cdot \int X' \cdot x dx = \int X' \cdot x dx \]
\[ \int V \log X \cdot x dx = \int V \log X \cdot \int x dx = \int x \cdot V \log X \cdot x dx \]
in which \( X' \) means \( dX: \, dx \).

INTEGRATION, DEFINITE. In the preceding article we have given some idea of the usual modes of integration. The results, which in the present article are given under the name of definite integrals, are mostly cases in which it is possible to find an integral when both limits are given [INTEGRAL CALCULUS, P. C. X.]; but not possible to find the integral in all cases. If we can integrate \( \phi \cdot x \cdot dx \) generally, that is, if we can find the function \( \phi \cdot x \), of which \( \phi \cdot dx \), is the differential coefficient, we can always express the integral, the limit of the summation in the article just referred to, as follows:---
\[ \int_{a}^{b} \phi \cdot x \cdot dx = \phi \cdot b - \phi \cdot a \]
but it frequently happens that \( \phi \cdot x \) is a function for which this cannot be done in a finite form, except for certain values of \( a \) and \( b \). And it happens almost as frequently that these practicable values are of particular importance.

But the view of definite integrals which best shows their utility is the consideration of them as fundamental modes of expression. The ordinary symbols of algebra, it is well known, are incompetent to express in finite terms by far the greater number of integrals. Consequently the integrals themselves become modes of expression, and frequently the only ones. When we find a language with which we have much in common, which has words which cannot be translated, and we adopt the words of that language into our own. Precisely the same thing is done in the case of definite integrals. Thus in FACTORIALES, P. C. S., we adopt the integral \( \int_{a}^{b} x \cdot e^{-x} \, dx \), as the fundamental mode of expression for a function till then inaccessible, which becomes 1.2.3...when \( n \) is an integer, and remains intelligible, though not very easily found, when \( n \) is a fraction.

Further to illustrate this, let us suppose that the integral calculus had made some progress before the conception of a logarithm had been formed: a thing which might easily have happened. It would then have been found that \( \int x^{-x} \, dx \) was wholly unattainable, a function which algebra could not express in finite terms. It would therefore itself have become a mode of expression, and it would soon have been proved that
\[ \int_{a}^{b} x^{-x} \, dx + \int_{a}^{b} x^{-x} \, dx = \int_{a}^{b} x^{-x} \, dx. \]

Here then would have been an obvious indication of the existence of a function proper to be made use of in performing multiplication by means of addition, etc.; and tables of the values of \( \int x^{-x} \, dx \) would have been formed by the method of quadratures [QUADRATURES, P. C.] or otherwise; which would, so it happens, have been a much easier task than that which fell on the first calculators of logarithms. For all this we are now enabled to perform by knowing logarithms and their properties; so that \( \int_{a}^{b} e^{-x} \, dx \) is seen to be \( x + C \), and \( \int_{a}^{b} x^{-x} \, dx \) to be \( \log x + C \), the logarithms throughout this article being Napieran. But we are not equally ready for \( \int_{a}^{b} \phi \cdot x \), or for \( \int_{a}^{b} \phi \cdot x \) (except when \( n \) is integer) or for \( \cos x \cdot dx \) and accordingly we are obliged to study the properties of these functions as fundamental modes of expression.

To give some idea of the use of this view, we exhibit a mode of solving the following partial differential equation, 
\[ \frac{dx}{dt} = \frac{a}{d \frac{du}{d \theta}} \]
the general solution of which cannot be expressed in finite terms. It will easily be seen that \( C \frac{dX}{dX} = \phi \cdot x \) is a solution for any value of \( C \) and \( \phi \), provided only that \( \mu = \cos \phi \), and also that the sum of any number of such terms is a solution. Hence we assume an indefinite number of such terms, giving to \( C \) the form \( \phi \cdot x \), and summing with them such values of \( \phi \) as will make the whole represent
\[ \int \phi \cdot x \cdot e^{-\phi \cdot x} \, dx, \]
and we then see that this integral is a solution or general value of \( u \), whatever the function \( \phi \) may be, and whatever may be the values of \( a \) and \( b \). By a reduction which is rendered easy by some of the results presently mentioned, this solution is thrown into the form
\[ u = \int \phi \cdot x \cdot e^{-\phi \cdot x} \, dx + \psi \cdot x \]
where \( \psi \) may be the symbol of any function. From this it is clear that the given differential equation has numberless solutions which ordinary symbols are incapable of expressing in finite terms. The treatise in the Library of Useful Knowledge on the Differential Calculus, Gregory's 'Examples of the Differential Calculus,' and that in the Mathematical and Physical Journal, contain various examples of this mode of expression applied to differential equations.

We now proceed to give a selection from the enormous number of definite integrals which has been given. They have been found by detached methods, so that we could not attempt to give anything more than the results. Our article is intended for reference to the forms which it is probable will be found in future elementary works, and which the mathematical reader may also wish to refer to. In order to avoid risk of broken or dropped letters, in an article in which the correct printing of the limits is of the utmost importance, we shall print what is usually denoted by \( \int \phi \cdot x \) in the following way, \( \int \phi \cdot x \) [a, b]. Any conditions as to the values of constants will be expressed before the integral.
It need hardly be said that the article *Factorials, P. C. S.*, must be considered as a part of the present one.

Among the integrals which clearly depend on, or are connected with, factorials, are the following:

\[ (m + 1 < n) \int \frac{x^{m-1} \, dx}{(1 + x^2)^n} = \frac{\Gamma(m + 1)}{\Gamma(n \cdot m)} \cdot \frac{1}{n} \left( \frac{\pi}{\sin \left( \frac{\pi}{n} \right)} \right) \]

\[ (m < n) \int \frac{x^{m-1} \, dx}{(1 + x^2)^n} = \frac{\Gamma(m + 1)}{\Gamma(n \cdot m - 1)} \cdot \frac{1}{n} \left( \frac{\pi}{\sin \left( \frac{\pi}{n} \right)} \right) \]

(from these come)

\[ \int \cos \varphi \, d\varphi \to [0, \infty] = 0 \quad \text{and} \quad \int \sin \varphi \, d\varphi \to [0, \infty] = 1 \]

from which it follows that the double integrals which have been much used, long before they were openly expressed, are:

\[ \sin \infty = 0 \quad \cos \infty = 0 \]

Some difference of opinion exists about these equations, which, in fact, involve a great deal of what has been done by mathematicians in the last twenty years.

When \( a \) and \( n \) are both positive

\[ \int \frac{\cos \varphi \cdot x^{n-1} \, d\varphi}{(1 + x^2)^n} = \frac{\Gamma(n + 1)}{\Gamma(n + m \cdot a)} \cdot \frac{1}{m} \left( \frac{\pi}{\sin \left( \frac{\pi}{n} \right)} \right) \]

\[ \int \frac{\sin \varphi \cdot x^{n-1} \, d\varphi}{(1 + x^2)^n} = \frac{\Gamma(n + 1)}{\Gamma(n + m \cdot a)} \cdot \frac{1}{m} \left( \frac{\pi}{\sin \left( \frac{\pi}{n} \right)} \right) \]

or

\[ \int \cos \varphi \cdot x^{n-1} \, d\varphi \to [0, \infty] = 1 \quad \text{and} \quad \int \sin \varphi \cdot x^{n-1} \, d\varphi \to [0, \infty] = 1 \]

This is a specimen of a sort of discontinuity which very frequently occurs, and from not attending to which mistakes have often arisen.

If we call \( \frac{1}{2} \) the hyperbolic cosine and sine of \( x \), and denote them by \( \cosh x \) and \( \sinh x \), we have the limits being \( 0 \) and \( \infty \), and a being less than \( \pi \),

\[ \int_{0}^{\infty} \sin \varphi \, d\varphi = \frac{\pi}{2} \quad \text{and} \quad \int_{0}^{\infty} \cos \varphi \, d\varphi = \frac{\pi}{2} \]

The integral \( n \int \frac{\varphi^{n-1} \, d\varphi}{(1 - \varphi^2)^n} \to [0, \infty] \) is the \( n \)th number of Bernoulli, meaning opposite to which \( 2a - 1 \) is written in the article cited. As a specimen of the reduction of definite integrals, the integrals

\[ \int_{0}^{\infty} \frac{\cosh \varphi \, d\varphi}{1 + \varphi^4} \quad \text{and} \quad \int_{0}^{\infty} \frac{\sinh \varphi \, d\varphi}{1 + \varphi^4} \to [0, \infty] \]

are severally equal to

\[ \frac{\sqrt{\pi}}{2} \int_{-\infty}^{\infty} \frac{dx}{1 + x^4} \quad \text{the first having} \quad -a, \text{the second} \quad +a. \]

Also

\[ \int_{-\infty}^{\infty} \frac{dt}{1 + \varphi^2 \to [0, \infty]} = \pi \text{, the} \int_{0}^{\infty} \frac{t \, dt}{1 + \varphi^2} \to [a, \infty]\]

The following is fundamentally important,

\[ \int_{0}^{\infty} \frac{\cos \varphi \, d\varphi}{1 + \varphi^2} \to [0, \infty] = \frac{\pi}{2} \int_{0}^{\infty} \frac{dt}{1 + \varphi^2} \]

* With respect to these equations, it must be observed that they are not to have their algebraical consequences; thus, since \( \sin \) is not 0, but \( \frac{\pi}{2} \). The truth seems to be, \( \pi \) as yet appears, that any function \( \varphi \), which becomes infinitely small in form, by the angle \( \varphi \) becoming infinite, is properly represented by \( \sin \varphi \to [0, \varphi] \).

For this reason, \( \sin \) and \( \cos \) are often used as such, but it is not considered correct to do so.
The integral \( \int \frac{dx}{x \log x} \) has been tabulated [Diff. Calc., L. U. K., p. 662] by Solder, and a great many integrals may be found from it. Solder proposes to call it the *Logarithm-integral* of \( a \), and to denote it by the abbreviation \( \text{li} \ a \). Adopting this notation, we have then, both in definite and indefinite forms,

\[
\int \frac{dx}{x \log x} = \text{li} \ a + \int_1^x \frac{dt}{t \log t} = \text{li} \ x + \int_1^x \frac{dt}{t} = \text{li} \ x.
\]

and so on.

Of miscellaneous integrals there is an immense number, of which we give a few instances:

\[
\begin{align*}
\left(1-x^m\right) \left(1-y^n\right) d \frac{x}{(1-x)} & = \text{log} \left(\frac{1+m}{1+y} \right) \Gamma\left(1+m+n\right) \gamma \left(1+m\right) \gamma\left(1+n\right) \\
\int_0^1 x \tan x dx & = \frac{\pi}{2} \sqrt{x} + 1 \\
\int_0^1 x \cot x dx & = \frac{\pi}{2} \sqrt{x} - 1
\end{align*}
\]

(a pos.) \( \int_0^\infty \sin bx \cdot x dx = \text{tan}^{-1} (b) \) 

\[
\text{if neither } a \text{ nor } b \text{ be negative}.
\]

\[
\int_0^\infty \frac{x \sin x dx}{x^2 + a^2} \log x = \frac{\pi}{2} \text{log} \left(1 + \frac{1}{a}\right)
\]

according as \( a \) is less or greater than unity.

Among the means of producing or using definite integrals which are comprehensive enough to deserve the name of methods, there are four which particularly deserve the attention of elementary writers.

The first is Laplace's mode of finding the approximate value of a definite integral in which large constant exponents occur. Let \( \phi x \) be a function of \( x \), such as \( x^{-a} \) or \( x^a \) \( (x-1)^{-a} \), &c., in which \( n, m, \&c. \) are considerable exponents. Let this function vanish when \( x = a \) and \( x = b \), and, continuing positive and finite throughout the interval, let it come to its maximum \( Y \) when \( x = X \). Let \( \varepsilon \) mean the value of the second differential coefficient of \( \log \phi x \) when \( x = X \), and assume \( \phi x = Y e^{\varepsilon x} \). Then

\[
\int \phi x dx = Y \sqrt{\frac{2}{\varepsilon}} e^{-\varepsilon t} dt
\]

provided that the limiting values of \( t \) on the second side are those which, in the equation \( \phi x = Y e^{\varepsilon x} \), belong to the limiting values of \( x \) taken on the first side. The best approximating cases are as follows. First, when \( a \) and \( b \) are the limiting values of \( x \), in which case \(-\infty \) and \(+\infty\) are those of \( t \), and the result is

\[
\int \phi x dx = \sqrt{2} \int e^{-\varepsilon x} dt
\]

Secondly, when the limiting values of \( x \) are \( X \pm \xi \), \( \xi \) being small.

In this case

\[
\int \phi x dx [X \pm \xi] = \sqrt{2} \int e^{-\varepsilon x} dt \left[0, \xi, \sqrt{\frac{2}{\varepsilon}} \right]
\]

This method is found, by itself, almost sufficient to meet the wants of the more complicated problems in the theory of probabilities.

Secondly, Fourier's theorem, as it is usually called, by which a discontinuous function can be expressed. This theorem is as follows,

\[
\phi x = \frac{1}{\pi} \int \cos w (x-v) \cdot \phi v dv dv,
\]

from \( v = -\infty \) to \( v = +\infty \), and from \( w = 0 \) to \( w = \infty \). Or thus: the equation

\[
\phi x = \frac{1}{\pi} \int_0^\infty \cos w (x-v) \cdot \phi v dv dv,
\]

is one which, for all values of \( x \), approaches without limit to truth, as \( k \) is diminished without limit positively. But if instead of the limits \( +\infty \) and \(+\infty\), for \( v \), we write \( a \) and \( b \), \( a \) being less than \( b \), then

\[
\phi x = \frac{1}{\pi} \int_a^b \cos w (x-v) \cdot \phi v dv dv
\]

is a discontinuous function, as follows: From \( x = -\infty \) to \( x = a \) exclusive, it is nothing: when \( x = a \), it is \( \phi a \); from \( x = a \) to \( x = b \) both exclusive, it is \( \phi x \); when \( x = b \), it is \( \phi b \); and from \( x = b \) to \( x = \infty \) it is nothing.

Thirdly, the following methods of expanding a function in series of sines and cosines has been extensively used by Lagrange, Poisson, and Fourier. We give it in the most general form after the manner of Poisson. Let

\[
\phi x = A_0 + A_1 \cos \frac{x}{3} \theta + A_2 \cos \frac{x}{4} \theta + \ldots
\]

then for every value of \( x \) from \( x = 0 \) to \( x = \infty \), both inclusive, this equation is true if

\[
A_0 = \frac{1}{\pi} \int \phi dx [0, \infty] \theta.
\]

Again, the equation

\[
\phi x = B_1 \sin \frac{x}{3} \theta + B_2 \sin \frac{x}{4} \theta + \ldots
\]

is true from \( x = 0 \) to \( x = \infty \), both exclusive, if

\[
B_1 = \frac{1}{\pi} \int \phi dx [0, \infty] \theta.
\]

Further, the equation

\[
\phi x = A_0 + A_1 \cos \frac{x}{3} \theta + A_2 \cos \frac{x}{4} \theta + \ldots + B_1 \sin \frac{x}{3} \theta + B_2 \sin \frac{x}{4} \theta + \ldots
\]

is true for all values of \( x \) from \( x = 0 \) to \( x = \infty \), both exclusive (becoming \( \phi x \) when \( x = \infty \)) if

\[
A_0 = \frac{1}{\pi} \int \phi dx [0, \infty] \theta \text{ and } B_1 = \frac{1}{\pi} \int \phi dx [0, \infty] \theta.
\]

But write \( 2l \) instead of \( \infty \), in the limits only, or write \( [0, 2l] \) instead of \( [0, \infty] \) and the equation becomes true for all values of \( x \) from \( 0 \) to \( 2l \), both inclusive.

Fourthly, we shall give two cases of the method deduced by Cauchy, as specimens: the complete method itself has some difficulties which are not yet overcome.

First, let \( \phi x \) be such a function of \( x \) that \( \phi (x+y) \sqrt{-1} \) vanishes when \( x = -\infty \) or \(+\infty\), whatever \( y \) may be, and when \( y \) equals \( \varepsilon \), whatever \( x \) may be. For every root of the form \( a+b\sqrt{-1} \) (\( a \) being either positive or negative, and \( b \) being positive, but both finite) which makes \( \phi x \) infinite, let \( (x-a-b\sqrt{-1}) \phi x \) be finite; calculate the value of this last product for each root. For every real root \( a \) of \( \phi x = \infty \) (\( x = 0 \) not being one) calculate half the value of \( (x-a) \phi x \). Let the sum of all these values and half values be \( P \). Then

\[
\int \phi dx [\infty,-\infty] = e^{iP}.
\]

Secondly, let \( \phi x \) be such a function that \( \phi (x+y) \sqrt{-1} \) vanishes when \( x = +\infty \) or \(-\infty \) independently of \( y \), and when \( y = +\infty \) or \(-\infty \) independently of \( x \). Take the imaginary roots only which make \( \phi x \) infinite, and let \( (x-a-b\sqrt{-1}) \phi x \) be always finite when \( x+a+b\sqrt{-1} \) is one of those roots, and \( x = a+b\sqrt{-1} \). Let the sum of all the values of the last product, for the cases in which \( b \) is positive, be \( P \); and for the cases in which \( b \) is negative let it be \( Q \). Then

\[
\int \phi dx [\infty,-\infty] = e^{i(P-Q)}.
\]

The subject of definite integrals is one in which the difficulties which have always appeared at the boundaries of mathematical knowledge are constantly met with. The consequence is, considerable differences of opinion about many points. On these the student who desires to use the higher parts of analysis must hope to form his opinion independently, when his reading and reflection are sufficient for the purpose. Most of these difficulties belong, in principle, to that va-
pauses the use of divergent series, which is the most important mathematical question now under discussion. If we were to find for the funeral expenses, as we well know, that a divergent series would one day take their undisputed place among well-understood objects of analysis, as negative quantities and their logarithms, imaginary quantities and their exponential decompositions, it would be a most interesting reflection, and discontinuous solutions of differential equations, &c., have successively done, each under a fire of objections which has well served the progress of science, by the defensive retorts of the 

It has required necessary it is fortunate for analysis that so many of those who find difficulties propose the entire rejection of the symbols or methods in which the dispute is conducted, or in some instance of it, that a distance of any rejection to efforts which they perhaps would not make, if they had only to meet the doubts of allies, instead of the attacks of opponents. That the symbolic expressions of which we are speaking, will never vanish out of remembrance, we may confidently predict: of all the points of difficulty of which we have spoken, it may be said, in the words of Horace

*Naturne expelles formam, tamen usque recurrit:

they will come, and will demand explanation until they get it. They will conquer by numbers, as Fontenelle said the symbol of infinity had done. And it is to be hoped and expected that, however the battle may be decided, the intelligence, the appearance of a successor, to excite new efforts, and be the stimulating cause of further progress. We should be sorry to think we had arrived at the *last impossibilities* of pure mathematics.

**INTERDICT, in the law of Scotland, supplies the place of an injunction from a court of equity in England. It is a prohibitory order, forbidding some act from being done, and it may be given on the application of any person who would be injured by the performance of the act. It may be issued by the Court of Session, or by the Sheriff's Court. Interdicts in the Court of Session are frequently obtained for preventing inferior courts, or courts of limited operation, such as the ecclesiastical courts, from exceeding their jurisdiction. To this end the form was frequently adopted in the late dispute in the ecclesiastical courts, which has been referred to above. (Allllus. Church, P.C. S.) Interdict is applied for by what is called a 'Note of Suspension and Interdict' presented to the Lord Ordinary on the Bill. In pressing matters, interim interdict is awarded before the parties are heard, but in the general case injunction is given to the other party, who gives in answers. If there are means by which the applicant's interests can be kept safe, as by the finding of security, or otherwise, the interim interdict will not be granted, but the 'vote' will be passed to try the question, and the matter will proceed as an ordinary litigation.

**INTERMENT. [INTERMENT, P.C.] Of late years the subvention of interments in England has increased, and a great amount of information has been collected. Though opinions are not unanimous, the evidence, the further it is examined, appears to prove that emigrants from crowded burial-places, or from overcrowded churches, frequently increase the health of the persons who live near them; and that these emigrants when sufficiently concentrated may produce speedy death. The general conclusion that all interventions in churches or in towns are essentially an injurious and dangerous tendency (Report on the Practice of Interment in Towns), is at least made a strong probability, and strong enough, coupled with other reasons, to justify the legislature in forbidding such interments, and placing all burying-grounds under such regulations as may prevent the effluvia from the dead from becoming detrimental to the health of the living. The Report to which reference has been made contains, in addition to the evidence on the injurious effects of overcrowded burial-places, much valuable information on the injury to health caused, particularly among the poor, by the delay in interments. The following remark will show the nature and extent of this evil: 'In a large proportion of cases in the metropolis and in some of the manufacturing districts, one room serves for one family of the labouring classes: it is the sitting-room, the bedroom, their dining-room, and bed-chamber. Among the poor in some parts of London the average time that a body is kept is about a week, which sometimes arises from inability to raise money; and it is quite possible that in the case of others there is only a single apartment, the dead and the living occupy it together.' The injurious consequences to health from the presence of a dead body sometimes in a state of rapid decomposition, in ill-ventilated apartments, can be inferred, particularly when death has been the consequence of malignant disease, cannot be disputed; and the effect on the living is demoralizing. The expense of funerals is another head which is examined in this report, where it is well remarked that 'the expense of interments, though it falls with the greatest severity on the poorest classes, acts as a most severe check on the energy of the class of so education and comfort. The cost of interment in London varies from 4l. for a labourer to 1000l. for a gentleman; for persons of the condition of a gentleman it is stated that 150l. would be a low average. But these charges do not include anything but the undertaker's bill. The account of the details of an expensive funeral, which is strictly the heraldic array of a baronial funeral, the two men who stand at the doors being supposed to be the two porters of the castle, are, &c., is ludicrous enough; but the disposition to laugh is checked by considering the pecuniary embarrassment which this absurd display often entails on the survivors. Many persons incur a heavy debt in the expenses of a funeral, and this is not unusual for poor people to liquidate such debt by instalments paid weekly, or at other short periods.

The subject of interment, like many others relating to the economy of society, is full of interest and significance. The general attention on the part of the state. It may be said, let every man bury his dead as he best can, and as he chooses. With respect to the rich, the expense is an absurd waste of money, and the expense of the middling classes, it is a heavy burden; but to the poor, interment of their dead is often almost an impossibility. To diminish these expenses, to secure the decency of interment amongst all classes, and particularly amongst the lower classes, is a matter of the highest interest. The living in the metropolis may be taken at 146 l. 9d. per head. But owing to circumstances, fully explained in the Report, even this lavish expenditure does not secure the proper and solemn discharge of the funeral ceremony, which, in crowded and busy districts, seems to be totally impracticable. It is fully shown that the expenses of funerals may be greatly reduced, and the due performance of the religious ceremonies may be secured by other arrangements. The establishment of cemeteries by Joint Stock Companies has done something by diminishing the amount of interments in crowded places, but the expenses of interment have perhaps not been at all diminished by them.

The Report concludes (p. 197) with a summary of the evils which require remedies; and there is not one of the evils which has not been touched on, the existence of opinion as to the degree in which the evils exist; but none as to the existence itself. The remedies that are suggested for these evils appear to have been well considered, though, when an evil is ascertained to exist, we may always agree as to the best remedy. One of the proposed remedies, which involves many important considerations, and would probably meet with some opposition, is 'that r tions.'
clements of a suitable description ought to be provided and maintained (as to the material arrangements) under the direction of officers duly qualified for the care of the public health.' Another is, 'that for the abatement of oppressive charges for funeral materials, decorations, and services, provided (in conformity with the best established practice abroad) by the officers having charge of the national cemeteries, for the supply of the requisite materials and services, to all classes, but especially the poor, the means of respectable interment, at reduced and moderate prices, suitable to the state of the deceased and the condition of the survivors.' The numerous matters contained in the Report can, for brevity's sake, be consulted by all who take an interest in the well-being of society, as a most valuable contribution to the statistics of civilized life.

(A Supplementary Report on the Results of a Special Inquiry as to the Practice of Intemperance in Towns, made at the request of her Majesty's principal Secretary of State for the Home Department, by Edwin Chadwick, Esq. Barrister-at-Law. London, 1843.)

INTERNATIONAL LAW. This term was originally applied by Bentham to what was previously called the 'law of nations,' and it has been generally received as more apt designation than that which it superseded. When the term 'law of nations' was first used, that of 'law of peace and war' was sometimes employed as a synonyme, and as indicative of the boundaries of the subject. It was thus in the proper sense restricted to the disputes which governments might have with each other, and did not in general apply to questions between subjects of different states, arising out of the position of the states with regard to each other, or out of the differences in the internal laws of the separate states. But under the pressure of the strong necessity of having a distinct indication of the whole of these subjects, intimately connected with each other as they will be found to be, can be comprehended and examined, and thus several arbitrary distinctions and exclusions avoided, show how these subjects are interwoven, the following instances may be taken:—A port is put in a state of blockade; a vessel of war of a neutral power breaks the blockade: this is distinctly a question between nations, to be provided for by the law of peace and war; in as far as there are any contumelious rules on the subject, and the parties will submit to them. But suppose a merchant vessel belonging to a subject of a neutral power attempts an infringement of the blockade, and is seized—here there is no question between nations in the first place. The matter is adjudicated on in the country which has made the seizure, as absolutely and unconditionally as if it were a question of internal smuggling, and it will depend on the extent to which just rules guide the judicature of that country, and not on any question settled between contending powers, whether any respect will be paid to the party's claim. The parties may plead in their own favour, on the ground of the comity of nations, or otherwise. But there is a third class of cases most intimately linked with these latter, but which are completely independent of any treaties, declarations, or other acts by neutral powers; that of throwing the war into each other. They arise entirely out of the internal laws of the respective nations of the world, in as far as they differ from each other.

The 'conflict of laws' is a term very generally applied to this branch of international law, and the circumstances in which it comes into operation are when the judicial settlement of the question takes place in one country, but some of the circumstances of which cognizance had to be taken have occurred in some other country where the law applicable to the matter is different. One of the most common illustrations of this subject is,—a judicial inquiry in England whether a marriage has taken place in Scotland according to the law of that country; or an inquiry in Scotland whether a marriage has taken place according to the law of England; in either of which cases there will generally be the further and nicer question, Which country's law ought to prevail as the criterion?

Thus the three leading departments of international law are—

1. The principles that should regulate the conduct of states to each other.
2. The principles that should regulate the rights and obligations of private parties, arising out of the conduct of states to each other.
3. The principles that should regulate the rights and obligations of private parties, then they are affected by the separate internal codes of distinct nations.

The first of these has been the principal subject of the well-known works of Grotius, Puffendorff, Vattel, and other publicists, who have derived from general principles of morality and justice a series of minute abstract rules for the conduct of nations towards each other, and subsidiary for the conduct of their subjects in relation to international questions. It has been usual to call this department the 'Law of Nature,' though it is not sufficiently established to be classed as so, while it is true that although it has not the support of the authority of any legislature, it is founded on the universal principles of natural justice.

It is clear that thus in its large features, as a rule for the conduct of independent communities towards each other, the Law of Nations wants one essential feature of that which is properly a national law, it is not of itself capable of enrolment as a rule binding on the world, which is rarely infringed. But in the more important questions, regarding what is a justifiable ground for declaring war? what territory a nation is entitled to the sovereignty of? what is a legitimate way of enforcing compliance to guarantees? and the like, the rules of the publicists are on principle, as the practice of nations has been far from regular, and has been, as every reader of history knows, influenced by the relative strength of the parties, the ancient authority of international law, and the like. The latter writers on this subject have from this circumstance directed their attention more to the means by which any system of international law can be enforced, than to minute and abstract statements of what may be theoretically just, but has little chance of being enforced. They have found several circumstances which have an influence in the preservation of international justice, though of course there are no absolute sanctions which can give it the uniformity and consistency of internal laws.

The combinations for the preservation of what is called the Balance of Power [Balance of Powers, P. C.] are among the most useful restrictions of ambition. All periods of history furnish illustrations of this principle. Hume found that the Peloponnesian war was carried on for the preservation of the balance of power against Athens. He added a noted illustration of combination to prevent universal conquest on the part of the French. The safety of small states from being absorbed by their larger neighbours, is in the preservation of the balance of power also to be desired. Thus the jealousy of rulers is one barrier to national injustice. Another is public opinion: sometimes of that nation whose rulers would be prepared to commit injustice—sometimes of another nation with a very limited extent that the public feeling of a despotic government can check the grasping spirit of its rulers; but the public feeling of the constitutional and democratic states is the great check on the injustice that might be perpetrated by a nation when it becomes so powerful as Great Britain.

The seizure of the Danish fleet by the English has been a subject of warm censure in this country. Necessity—even the plea that Napoleon would have used the fleet to invade our own shores—has not been accepted in palliation of the act; and the manner in which it has been canvassed is very likely to prevent any British government from adopting the precedent. The seizure was taken in violation of the law, and injustice condemned by the public feeling of countries other than those by which it was perpetrated; and it may be questioned whether the states which accomplished the partition may not have been influenced by it. Good fame in the conduct of nations is like respectability in private circles, a source of power through external support; and the conduct of Russia towards Poland has frequently diverted from the former country, by its policy of free nations. It need scarcely be observed that the press, whether fugitive or permanent, is the most powerful organ of this public opinion, and that the views entertained there, as well by patriots, jurists, and moment, in the preservation of international justice. Among the principal subjects of dispute in this department of international law are—the sovereignty of territory and the proper boundaries of states, as in the question at present under debate re-
garding the Oregon territory in North America; questions as to discovery and first occupancy of barbarous countries; questions as to exploration; the frequent occurrence of disputes between the nations; and, here there is a well-known distinction between the broad ocean and the narrow seas that lie in parochial territories; questions regarding the right of navigation in rivers which form boundaries; the right of first occupation of lands or states on opposite banks; questions as to the right of fishing, hunting, &c.; and questions as to the right of trade with particularizing persons. A very frequent cause of international disputes has been frequently had recourse to late in a submission to the arbitration of a neutral power. Pride and the spirit of not yielding to intimations of submission by any method whatever, have been the great reasons of a nation's renunciation of another's claim, than the desire to keep what is demanded. In such a case the national pride is not injured when that which is yielded to is the award of a neutral party, not the demand of an opponent. It has been suggested by Bentham and Mill that the civilized states of the world should establish themselves a congress, which should adjudicate on all disputes between its members, the members being excluded from voting in their own disputes.

The Second department into which we have considered international law divided—the rights and obligations of individuals as affected by the conduct of states towards each other. It is not necessary to go into the various theoretical matters; but it has, perhaps, received so much practical illustration as it did in the British courts, particularly in the Prize Admiralty Court, during the late wars. In a country like ours, where the existence of commerce and the interests of a powerful merchant navy are so indissolubly connected, the bench should give effect to the national policy of the government, whatever that may be. But in England it was the rule that foreigners as well as nations were entitled to the same judicial redress from the courts that could be given to subjects of the same country. If the proceedings of the government were at variance with the rights of parties according to the law of peace and war, individuals might have redress. Thus, when Great Britain, in opposition to the Berlin decrees, tried to establish a paper blockade, that is to say, by force of orders in council to declare places to be under blockade, whether there were a force present to support the blockade, as a matter of public law, was submitted to the courts. The notion of a complete blockade, it is included that the besieging force can apply its power to every point in the blockaded state. If it cannot, it is no blockade of that quarter where its power cannot be brought to bear.'

It has frequently been observed, that as to all departments of the law of nations, uncivilized countries are at the mercy of the civilized: that not having any means of reciprocating the action of international laws, from their having no systematic judicatures of their own, they have not even the fruitful tenor of generally received opinions as to what the conduct of independent nations towards each other ought to be, for their proceeding, in their relations as a state, has been often the act of the child of civilization, which can eloquently appeal to the law of nations, is feebly protected against the injustice of a strong nation, still less effectually are a barbarous community, who never heard of the obiter dicta of the court, and who are unknown to the acknowledged principles, protected by it; and, in regard to them, the humanity and conscience of the powerful nations coming in contact with them are their protection, rather than any rules of international law. Thus when, as in the instances of a colonial government or otherwise, such a nation as the British has to deal with the inhabitants of a barbarous country, it cannot be said that these inhabitants have the law of nations to appeal to if they are unjustly treated, and there is no sanction for their being well and humanly used but the morality and conscience of the British nation and its government. It is also the case that nations had in former times disregarded all feelings of common humanity in their intercourse with inferior races, the history of colonization, and especially that relating to the continent of America, is a horrid record. In later days higher notions have been entertained of the responsibility of superior power, and the civilized man has in some measure ceased to make his first advances to the notice of the barbarian in the character of a murderer and a pillager. Britain and the United States have shown an example of giving rights to other nations, as to be the protector of barbarous races from the oppression of others, in her efforts for the abolition of the slave trade and the preservation of aboriginal nations. These efforts, when extended to all the aboriginal races of nations, have introduced some necessary exceptions to the rules of international law applicable to the rights of persons. This has consisted in the necessity of treating those who are injured by the slave trade, viz. the slaves carried off, as if they were subjects of this country subjected to injury, while the slave traders who have been indicted the trial was a general case as if they were subjects of this country doing the injury. The effect of this state of matters, as an exceptional principle in international law, sometimes occurs difficult in the case of the English, who have on some occasions had been captured and taken possession of. The crew rose, and putting the captors to death, recaptured the vessel. They were tried and condemned to death for murder in an English court; and the vessel was, in the same manner, treated, as if it had not the plea, that, as the capture had taken place under our laws, not their laws, they were entitled to regain possession. But by a notification which the British government held it right, in fact, to treat the ship as a prison, and the captured seamen as persons in a British prison. On the question however coming before all the judges, the conviction was declared invalid, the principal ground of the reversal being, that the vessel not having slaves on board was not legally liable to seizure. In those cases where it is necessary to diverge from the general principle of international law, for the protection of the weak, it is the mission of enlightened and enlightened motives of proceeding is a guarantee for its being beneficially exercised.

The rights of individuals have sometimes been so much affected by the conduct of nations towards each other, that the same questions in the same cases occur in courts of searching American merchant vessels for British seamen. On the subject of the present dissatisfaction of the question as to this right of search, see Redding in his Maritime International Law (4, c. 43-44). 'Unfortunates,' says Redding, 'right of search of right was left undecided either way by the hastily concluded treaty of Ghent in 1814, which terminated the war between the parent state and what were originally her colonies. And as the divergence in the personal appearance, language, habits, and manners of the inhabitants of the two countries was not likely, for generations, to be such as to facilitate the discrimination of the subjects, questions of this nature must be regretted the question was not subsequently settled by the negotiations of 1818 upon the equitable footing of regular authentic lists or registers of British and American seamen being made up and kept, and of the nationality of the seamen being thereby determined.'

The Third division of international law is that which most properly comes under the head of 'Conflict of Laws,' viz. the principles that should regulate the rights and obligations of private parties when they are affected by the separate internal codes of distinct nations. This has some points in common with the preceding department of the subject. It involves the principles of international law, and, not as questions of existence, but questions with its states; and the adjustment of each question depends on the view taken by the law of the country to which the individual or his property is amenable. But it must be remembered that the circumstances in which disputes may arise are not in the conduct of one nation towards another, but in differences between the internal laws of the countries, which internal laws dissolve, not because the one nation has a dispute with the other, but in the general case because its legislators have taken its internal situation solely into consideration, and have overlooked the existence of other nations. There can be no part of the world where this species of international law can be so well illustrated as in the United States—a collection of communities, each having an internal system of administration, but each acting on principles of harmony and alliance with the other states. It is thus natural that America should have produced the best work on the subject, in Professor Story's 'Commentaries on the Conflict of Laws Foreign and Domestic, in regard to Contracts, Rights, and Remedies,' and especially regarding the Marriages, Divorces, Wills, Successions, and Judgments, of which two editions are now known and esteemed in this country. The leading rule of international law in this department is this, that each civil law system has its own peculiar tendency to give private right of action, not in favor of a wrong to the other nation, unless its own laws or the general principles of justice are thereby invaded. We have the broadest and most distinct illustrations of this rule in the case of private crime against persons property. In conformity with
this principle, treaties were lately made with France and the United States of America, for enforcing which, in this country, two acts of parliament were passed (6 & 7 Vict. c. 75 and c. 76), by which a secretary of state, on the requisition of the ambassador or other representative of France or the United States, was warranted to sign an embassy to a person accused of a crime, a magistrate being enjoined to put it in force on his being satisfied that the charge is of such a nature as would authorize him to commit a person charged with perpetrating it in his own jurisdiction. [Cf. excerpts from TREATIES, P. C. S.] But it has been a rule in many countries, and particularly in our own, that no aid is to be given for the enforcement of the political laws of foreign states. As in other branches of international law, our embedded principles on the subject of slavery have here been the cause of perplexing difficulties. With slave-holding countries slavery comes to be a question of property, but with us it can only be a question of government; and we cannot view any rules regarding property in slaves as laws relating to private rights, an infringement of which, when held to be criminal in the slave-holding country, must be so also here. Accordingly, in the celebrated case of the Creole, in November, 1841, when certain American slaves escaped and found protection in a British settlement, it was found that we could not send them back to their owners who had with slave-traders stolen their own persons from the custody of their proprietors.

As on the one hand the criminal law is that to which this department of international law most broadly and distinctly applies, so on the other hand the property is that to which it has generally the least reference. The reasons of this distinction are very obvious: his own personal conduct is that object of the law which a man most completely controls, and the question from one country to another, his connection with landed property is the relation in which a tribunal out of the country in which the property is, can have the least chance of adjudicating. Between these extremes there are many cases of comparative positions in each other, and regarding contracts as to moveable or personal property. It came thus to be a general principle, that rights connected with landed property must always be settled by the laws of the land in which it lies, whereas questions regarding other property might be subjected to other criteria of jurisdiction. Perhaps historical circumstances in the early history of the European nations favoured this division. The various tribes which occupied the territory of the Roman empire appear to have carried with them their own peculiar laws and customs. Savigny quotes a letter from Bishop Agobardus, in which he says it often happens that five men, each under a different law, may be found walking or sitting together—a state of society at this day exemplified in some oriental nations. Among all these distinct tribes the feudal system arose as the general law of feudal territorial law. But a series of circumstances which need not be here narrated, the civil or Roman law became the ruling principle as to persons in their relation to each other when that relation was not of a feudal character. It contains many clauses regarding landed property in the common law of England has perhaps had the least affinity with the other European codes. But it has fortunately happened that those departments of the law with which international questions are chiefly concerned,—the consularial and the admiralty law, have been considered as the legitimate offspring of the civil law, and have adopted in a great measure its principles as they have been in practice throughout Europe. The mercantile law in general of England has accommodated itself to the custom of merchants; and this custom has in a great measure arisen out of the adaptation to modern commerce of the principles of the civil law. The portion of the commercial code of England which is least in harmony with that of other countries is perhaps the bankruptcy law, which, being statutory, has not so pliantly adapted itself to the exigencies of foreign commerce as the consularodial portions of the commercial code of England have done. Thus, under the bankruptcy or bankruptcy statute of Scotland, which was supposed to give the trustee or assignee full power for obtaining possession of the bankrupt's property in all parts of the world, it was found that he had no power to apply this to the bankruptcy in England—the right of the trustee being that of an assignee merely, and a right to a debt being a chose in action, and therefore not within the scope of the discovery law of England. See Jeffrey v. M'Taggart, 6 M. & S. (K. B.), 120. The law of bankruptcy appears to be one of the most difficult of adjustment to international principles. There are clauses in the bankruptcy and insolvency acts of England by which, through registration of the vesting order, the assignee became invested with all real or landed property in any of the British dominions where a conveyance of such property requires to be recorded. (See 1 & 2 Wm. IV. c. 56, § 27, and 1 & 2 Vict. c. 110, § 46.) It could not have been the intention of the framers of these laws to vest a person to whom a bankruptcy has been decreed in the strict interpretation of the English provision that no such preliminary was necessary, and that the registration of the vesting order was sufficient. (Katurey v. White, 8th March, 1842, 4 D., 890.) The laws of England, therefore, are not in this part of the world the most important and interesting. The consuetudinary or unstatutory law of England has perhaps fewer principles in common with that of Scotland than the latter has with the law of any other country in Europe; and this divergence has been the cause of many difficult questions. In these the law of marriage and that of succession have been particularly fertile. In the former the difference between the institutions of the two countries, when subjected to the principles of international law, has been productive of very remarkable effects. In England there are certain acts which must be contracted, by the law of marriage, or lawful marriage. In Scotland the consent of parties to hold each other as man and wife, when sufficiently attested, is, according to the doctrines of the civilians, sufficient. But in England it is a marriage when it is a public, or legal, or declared in the place where it is contracted valid in England; the consequence is, that the law principle of marriage by single attested consent would have probably fallen into desuetude and oblivion in England, if in the law of Scotland it included all marriage, who thus evade the restrictions of their own law. On the subject of succession, a series of decisions in both countries has settled two very important principles—that in the case of landed property, full power of sale, or disposal, must be given to the owner of the place where the property is; while in moveable or personal property it follows the lex domicilii, or law of the domicile in which death occurred leaving it intact.

INTERROGATORIES. [EQUITY, P. C.] INVENTION. [PATENT, P. C. ; COPYRIGHT, P. C. S.] INVENTION AND DISCOVERY. The rights of individuals, as to the honour due to the origin of new views, processes, or methods, are matters of constant discussion in the history of letters and science. It is strange that the subject should never have been generally treated: and in default of better, we may be content to put materials for consideration, which may perhaps help the young reader of the history of science (from which our examples will mostly be drawn) in forming his opinion of the controversy. Invention and discovery are, for our present purpose, synonymous terms. As commonly used, the first signifies the formation of something which would not necessarily have existed before; the second signifies something which has come out that which always did exist, and would have existed whether the discovery had been made or not. We all perfectly see the error in the assertion, set down for correction in the English exercise-books, that 'Galileo discovered the telescope, and Harvey invented the circulation of the blood' and also the propriety of the assignment of words made by Mr. Macaulay, when he says that the terms in which Machiavelli is usually described would seem to import that he was 'the discoverer of ambition and revenge, the original inventor of perjury.' We can imagine the possibility of a telescope having never been framed, or a false oath having never been sworn; but long as they exist, and his blood circulate, feelings of ambition and revenge will spring up in his mind. The words have some analogy with those of problem and theorem in geometry: and particularly in this, that invention can be said to be the discovery of the existence of a new principle, and discovery the discovery of the art of writing. In this manner it may be asserted by some [BACON, ROGER, P. C.] that Roger Bacon discovered the telescope. There must be then some case in which the discovery is lawful, and some law that every discovery leads to invention. But yet there is some cases in which the preceding definitions fail to describe the actual use of words: for example, bichromate of potash was never found in nature, never discovered: its ele-
ments were compounded in the laboratory by its inventor. But this is only to call attention to the fact that there is
nothing but a discovery: we should recommend them to draw
the distinction, as useful to the memory in relation to the
history of their science.

The words discovery and invention are tempting
resemblance, often just, and often fallacious, to those of
theory and practice. But in fact each of the things must be
subdivided into theoretical and practical. The effect of the
non-spherical form of the earth upon the moon's motion was
discovered theoretically: the variation and the ejection were
discovered practically. As to inventions, we call Davy's
safety lamp a theoretical invention: for the question given
was how to overcome a certain inconvenience: generally, it was
not even assumed that a lamp was to be constructed. But
the common story of the boy who saved his labour by tying
a string from the valve he was employed to open and shut
to a part of the machinery which moved in such a manner as
to do it for him, is, if true, a record of a practical invention.

Still there is truth in this, that practical men, properly so
called [Theory and Practice, P. C.], have invented
to a stranger than the things they have discovered; and that theoretical men
have discovered more often than they have invented.

It is no wonder that the early history of discovery should be
coveted and uncertain: the history of documents, which oper-
ates on all our first knowledge of antiquity, is a sufficient ex-
planation. Nor is it surprising that first writers should be
persons of unsettled claims; that in the case of Euclid, for
example, we do not know a single document, no discover-
cies began as where they ended. But it does seem
strange that in matters of our own day, or that immediately
preceding, it should be a question to whom a right of dis-
covering, or even the right to distinguish them, should go.
A look, to the date of the publication of which there is every
possible attestation.

There is one most important preliminary consideration,
which will in the minds of some few be the first time it will
be noticed, and examine the face of the whole question.
When the period arrives at which a discovery becomes possible,
there are many courses which lead to it, and many ships
sail in the same direction; but the one which be-

further. When a new island is discovered in or near a fre-
quent track, as soon as a ship of some one country casts
anchor in a port and takes possession, it may be no
words found in some logs that something like land had been
suggested before, in others that land birds had been seen,
and in others that the colour of the water was noted, in others that
an alteration of the current was observed, and so on, all near
the same point, and any one of which might have led to the dis-
coveries of the hint had been followed. It is the same in matters
of science, to an extent which will not be easily credited by those
who live in the midst of the great centres, and it enhances the merit of
most original researches. It is much to the credit of Newton that Huygens
had gone so far as to determine the conditions of circular motion, that
Grimaldi had been the first to explain the properties of light, and that
Cavaleri had all but discovered the method of fluxions. The character of accidental good fortune disappears when we see
that the progress of knowledge seems to bring new results within the possible reach of many, but within the actual
reach of only one. Is there then nothing accidental in dis-
coveries and inventions? We answer that there is something,
but that the accidents which might produce discovery are
happening to all, and frequently; while the accidents which do
produce it happen to those only who are ready to take advantage
of them. But this it may be said is reasoning in a circle; for if
we had asked how we distinguish the person who is ready to take
advantage of the accidents, from those who have only the dis-
coveries to point to. We reply, that it generally happens that
the persons who can thus fix a causality, are also those who give
evidence of successful research in cases when fortune seems
without special favor. It was by a mere accident that Mr. Baily
[Flamstead, P. C.; Baily, P. C. S.] bought a house oppo-
site to the possession of a large bundle of Flamsteed's letters,
and nothing more than the fact of their existence came to his
ears. Many perhaps had seen them, and either taken it for
granted that the contents were all in print, or been unable to
judge of their value. But the life of Flamstead is not the only
one that has had this history: there was no accident about the editorship of the old
catalogues. It is said to have been by a casual effec-
t of a mist at a window that Malus discovered the polarisation of
reflected light; but then Malus was a profound optical in-
vestigator. It is our conviction that no accidents are
valuable except those which have the probability of right
times; and that there are usually other means of showing this
besides the success of the accidents themselves.

Before we can examine the title to a discovery, it must first be
settled what the discovery is, and the principal point at issue is,
what is the steam-engine. Heron of Alexandria certainly
produced rotatory motion by steam, and, with sufficient funds,
could have ground all the corn in Egypt by his method. If
we assign the merit to the person who contrived such an
economy of fuel as to place the use of steam on something like
its present footing as a commodity, it is then a question
whether any except Watt has the claim. M. Arago remarks
on this subject, that a watchmaker would be struck dumb by
the question, who invented a watch? The thing as it now
exists is not the invention of any one person. As long as
there is any national feeling in the discussion, one or another
definition will be proposed, constructed to suit the advocacy
of one or another claim. We have not here to decide the
cases which we cite; it is enough that they illustrate our

point. It may happen that in a complicated instrument or method,
the perfection of which involves a variety of documents, each
some one distinguishing characteristic the introduction of
which marks the main epoch of the invention. In the case of
the watch, for instance, if we ask for the distinctive definition
of the watchmaker, it will be seen that it is the clock, or the
measuring time, which would include the clock, or an application of wheel-work for that purpose, which would in-
clude the clock; but it is the use of a spring for the regula-
tion of the mechanism should be the question. It is to a
look, to the date of the publication of which there is every
possible attestation.
It is not always, to be sure, that this goes such a length as procuring for Dalton's atomic theory the character of being a reproduction of the notions adopted by Epicurus from his predecessors; if it did there would be the least harm; there are many connections between which misgivings are put in the way and it is easily brought between them. The nomenclature of science is perplexed by phrases of no precision—as that Newton discovered the motion of the heavenly bodies by means of gravitation—that he first advanced the true theory of astronomy, which he did in one sense, and Copernicus in another; whence the provinces of the two are frequently found to overlap; it must also be remembered that a little earlier than this opinion, the result of choice between several, one or other of which must have been taken, is confounded with the same opinion advanced and supported by reasons. Thus Philolaus and Arastarchus asserted the motion of the earth, and Copernicus is said to have only revived their opinion. The difference between the two cases lies in this, that the antient philosophers merely asserted their belief, the modern one made his hypothesis the means of accounting for all the known motions of the heavens, diurnal, annual, and precessional.

The specification, to borrow a term, having been agreed upon, the next question is, what constitutes a claim to discovery? The answer is, priority of publication. To this, as it has often happened, two persons should discover the same thing about the same time, the one who first publishes is universally recognized as the discoverer. Of course, if a fraud can be found to be satisfactorily shown, the first publisher shall recover his matter from another, he would not be allowed the advantage of his wrong: but the onus of proving the fraud lies entirely upon the asserter of it, and, until the evidence and the practice of the law, determine whether there be a reason for the rule. The reasons for this rule are not altogether those which exist for the rule in law. The objects of the latter are the protection of private rights and public peace; or rather the assignment of private rights in such a manner, as best, in the long run, to promote the welfare of the community, and particularly its peace, without any great shock to the natural feelings of equity. It is not difficult to conceive a case in which men would have a small personal advantage, yet be not disposed to natural justice, or what is so called, for the sake of a rule which would prevent them from lying to prevent the assertion of it. But if the object of the scientific historian is truth for its own sake; he has nothing to do with conventions made for the sake of peace.

This rule, that first publication gives the right, until the contrary is proved, is adopted for the sake of its own probability, as a starting point. Select, at hazard, the name of a result, and of its first announcee; no doubt will exist in the mind of any one, used to the history of science, that it is at least fifty to one that the discovery is the first public. But it is the fact that the discovery was made at an earlier period, and that if that fact can be established, the history of the human mind must not be falsified by adherence to a rule. If, for example, it could be shown that Archimedes must have had a geometrical and a differential calculus, which deference to the notions of his time prevented him from publishing, it would never do to let the formal claims of Leibnitz and Newton prevent the allowance of that of Archimedes: for then would result the suppression of the actual fact, which, if true, would be of great consequence, namely, that the Greek mathematicians were powerful enough to lead their best minds to the discoveries of modern times. We insist upon this because we have observed a considerable tendency in writers of history to establish a rule on legal grounds of peace and convenience. There is also a confusion between two distinct things: the claim to the discovery is different from the claim to the publication: the former demands true facts, the latter just appreciation of his merit. By a perversion of the human mind, Newton and Leibnitz would lose fame to-morrow, more or less—that is, more with some and less with others—as if a small number of Archimedes's papers were to turn up, showing that he possessed a formal differential calculus. We are apt to assign praise to mere priority, independently of originality, and to withdraw it on failure of priority. But the priority of publication is not the same fact. If the priority of the idea lies in this, that the earlier an invention or discovery is made the sooner the methods and instruments, and the fewer the hinds to which it is due. For example, D'Alembert reverts to the priority of Tartaglia (Tartaglia, P. C., p. 126) in, or shortly before, 1754. He has all the merit due to the discovery, as n. 1754. But could it be proved now that Taylor's works, &c. were recent forgeries, so that D'Alembert should stand as the original inventor, it would be impossible to put him in Taylor's place: the differential calculus was in two very different states in 1716 and in 1754.

There is also an injurious tendency to stand by the fixed rule as a thing of good consequences, in the way of punishment or stimulus. The first who discovers the item, but right to substitute, in history, the thing which is not for the thing which is, there are advantages arising from the adoption of the right discovery. Tartaglia [Tartaglia, P. C.] suppressed his method for cubic equations from a selfish motive: Cardan, to whom he had communicated it under promise of secrecy, published it, with a sufficient acknowledgment; and in the same breath, whatever may be the case, little to regret here: Tartaglia was willing, simply that he might be able to puzzle his contemporaries, to retard the progress of algebra; it is not certain that he ever would have published his discoveries. The public has rewarded the individual to whom they were indebted for knowledge by exalting his name to the rule he announced. If it were understood that the name attached to any scientific result was always that of the first publisher, saving all the rights of history over the truth of the discovery, this and similar acts of nomenclature might be a satisfactory use of the norma loquenti. It has sometimes happened that individuals have deposited sealed packets with the request that no one should open them until after their death, and before any one else arriving at results which they wished to avoid making public until they had followed them out to their remote conclusions. This practice is one which would not prevent the contents of the packet, if it came independently by the same results, and published them before the packet was opened.

The next question is, what constitutes a sufficient publication. A printed book, pamphlet, magazine, or paper, in which any one who likes may buy, is a record of the court of history from the day of its appearance: but any other mode of communication, which is of its own nature not addressed to the public at all; and it may be doubted whether it can be available. A communication to a scientific body, for example, is only so much better than a letter to a friend, as it is more public and more easily proved; but unless it be published in the transactions of that body, in which case it runs with a book from the date of publication, it will require subsequent establishment. There is, however, always a difficulty with regard to such communications, when the transactions of the academy in question do not appear till some time after the reading of the memoir. It is impossible to know what an author has added as the paper went through the press. He is the best judge of the press. In some cases it is always necessary to assume the date of publication, unless some proof can be given that the memoir as published is, in the matter under dispute, the same as that which was originally intended. It is impossible to imagine that Archimedes or Ptolemy would communicate his work before it was printed. It is too little doubt that, in course of time, bodies which publish transactions will find it necessary to require that authors shall either print their communications as presented, or date such additions as they feed, desirous of making.

The most remarkable question of publication of which everyone was that relative to the invention of fuses, &c. [Fuxionis, P.C.; Commercium Epistolicum, P.C.] There never was a case in which it was more necessary to consider the rights of history, and not to judge by any fixed rule. Newton, unquestionably the first to discover the principle of fuses, &c., was not the first to publish. An anagram, or transposed sentence, cannot be looked upon in any other than as a sealed packet. Leibnitz has accordingly the full merit of an inventor, and the priority of publication is no reason why he could have published it, if he had chosen.

It frequently happens, as before observed, that independent discoveries take place about the same time; then is no doubt that such is the fact. When the publications take place very nearly at the same time, particularly when they are in different countries, it is easy enough to admit the real independence of each. If the same notices of the Royal Society and the Comptes Rendus of the French Institute within a few weeks of each other, the presumption is strong in favour of neither writer having had a communication, directly or indirectly, from the other: and
this presumption must be rebutted by any one who desires to prove the contrary. But this becomes impossible without it. Archimedes was the greatest of the Greek philosophers; but Sicily was the birthplace of the great mathematician. The question, therefore, becomes a question of degree only, so far as it is derived from time only, is weakened. In such a case, the internal evidence of the writings themselves must be carefully looked at. There is probably a clear difference between the discovery made by the different investigators arrive at, and even in which they state, the same conclusions; those who would do a dishonest thing might know this as well as others, and might endeavour to conceal the false origin of their discovery. To detect the falseness of such a fraud is not always easy to prove its baseness is next to impossible. It mostly happens that really independent investigators carry their results to different lengths; one will go further in one part of their research than another. As may be supposed, the most disputed cases are national ones; including in that term the schisms of different classes in the same country, as the scientific feuds of universities, of literary societies, &c. And between people of different countries and governments, the question arises in two distinct ways, not only as to the definition of the discovery itself, and the priority of publication, but as to the country to which the discovery is to be said to belong. And here there seems to us to be a necessity for a distinction which is rarely made, and no wonder; national pride is the mortal enemy of discriminative argument. All people like to believe that their race is gifted by nature in proportion to its talents; and that their public policy is calculated to draw it out. For proof of this they appeal to their great writers and thinkers, among whom they include all whom they have drawn into their country, and all whom they have driven out. Not a man of the eminent men who have been induced to settle in a country not their own, may be a credit to the institutions, but can be none to the race, of their adopted country. Those who are honour to the race but not to the institutions of the land from which they are exiled. Take the cases for instance of Lagrange and De Moivre. Lagrange, who, of many offers made to him when he left Prussia, pre-}

INVESTITURE.

INVOLUTION AND EVOLUTION. In our article under this head, we gave an account, with instances, of the method of solving equations, which is commonly known by the name of the method of AGF. W. G. H., in his Bath. We believe we may usefully give here a consideration extension: first, because the method [Computation, P. C.] is one of the best examples of a constant; secondly, because its meaning nor its theory is very generally understood, and the latter is very instructive. We suppose the reader of this article familiar with the one which preceded it. The process of 

\[(ax+by)z+c=dx-4] \]

Horner's method of doing this, takes the figures from left to right, or takes those of largest value first; and exhibits a plan of performing the operation, which combines the result of each figure with the joint result of all that come before. Thus in finding the value of the preceding when \(x = 123-456\), the value is first found when \(x = 100\); then, by the help of the preceding, \(x = 120\); then, when \(x = 123-4\); and so on. By this means we are enabled to proceed, when the value of the succeeding figures depends upon the one which preceded. The procedure in this case is as follows: a great many figures (about 116) being repeated twice over, in a manner wholly unnecessary in computation, in order to facilitate the explanation.
We first put down the coefficients as usual, not changing the signs, and give them which is only a convenience, and does not alter any figure). The value of \( x \) being 121-23, we begin with 100, which, having two ciphers, we mark off by commas from the several coefficients 0, 2, 4, 6 places. We then proceed by Horner’s process with the figure 1 (not 100), taking care to make commas fall under commas, or to use the commas as if they were decimal points (which they are in fact, though not upright-points). As soon as we have done the figure 1, we note all that comes before the lines \( A \), we learn as follows. Let

\[
\frac{\partial^2}{\partial x^2} = 3 \times 141 \cdot 0 + \text{000} \cdot x - 1427 \cdot 499
\]

then, \( x\), being 100, \( \phi, \phi, \alpha, \beta, \gamma \) and \( \delta \beta \) are severally 8987633-801, 289371-809, 2896-829, and 9. We then write down the results again, after the lines \( A \) (which is not necessary in calculation), merely to show the new disposition of the commas. We are now to proceed with 20 (from the first in 121-23), which, having one cipher, we mark off 1, 2, 3 places in the several columns. Immediately before the lines \( B \) we learn that when \( x = 120, \phi, \phi, \alpha, \beta, \gamma \) and \( \delta \beta \) are severally 15505348-181, 352634-469, and 3269-836. We then write down these results without any commas, and proceed with the second in 121, from which we find that when \( x = 121 \), the functions are 18986535-209, 396456-458, and 3269-836. We then begin to provide for the decimal point, by annexing one, two, and three ciphers to the working columns, and taking the second 2 in 121 to work with, and applying Horner’s process, we find, when \( x = 121-2 \), that \( \frac{\partial^2}{\partial x^2}, \phi, \phi, \alpha, \beta, \gamma \) and \( \delta \beta \) are severally (remembering that all the annexed commas are so many additional decimal places) 15987573-212790, 352634-51690, and 3269-2550. Finally, we annex the ciphers again, and with the 3 we find that \( x = 121-23 \) gives 15987573-760554100, 396049-8904400, and 32900-06800.

Let us now compare the trouble of this process with that of any other method of doing the same. If we throw out all the figures which we have written twice over merely for explanation, and also the last two and one lines in the second and third columns, which are only wanted to go on further with, we have written down about 280 figures. The ordinary verification costs about 340 figures. It is true that every step is both a multiplication and an addition in one; but this can be done and ought to be done in the use of this method, and hence done in the ordinary method. And we have not only the advantage of a purely mechanical method, in which the first arrangement causes the succeeding steps to require nothing except a look at the successive figures of the value, but the still greater advantage of being able, at the end of the process, to make any small alteration of value with ease. If, for instance, having discovered that 121-297 would do better than 121-23, we wish to geographical accuracy, we have but to rub out the last 3-process, and proceed with 9 and 7. In the ordinary mode, we must either repeat the whole process again, or correct approximately by substituting 121-000, which will require us to calculate \( \frac{\partial^2}{\partial x^2} \) and perhaps \( \phi, \phi \).

We will now exhibit a common multiplication, and the formation of a square: not, of course, that we attach any particular value to these simple cases, but that we may show the uniformity of the process. Required 14796 \times 32316, or the value of 14796 \times 0 when \( x = 32316 \). We repeat the lines as before, which is more than is necessary, and makes this process look very long.

\[
14796 \times 0 \times 0 \times 32316\]

Then follow the square of 279-46, or the value of \( x^2 + 0x + 0 \), when \( x = 279-46 \).

\[
1 \times 0 \times 0 \times 0 \times 0 \times 32316
\]

The process here described is one which, we venture to say positively, has neither been put in its right place, nor received its due reward. It is the natural extension of the common process of multiplication, and its inversion is as naturally and necessarily the proper mode of solving equations, as that of multiplication is the same for the simple equation \( ax = b \), or common division. The invention of it must rank, not with the analyst or the algebraist, commonly so called, but with the discoverer of the process of multiplication and division, and the extraction of the square root.

The application of this method to the solution of \( \frac{\partial^2}{\partial x^2} = 0 \) consists in finding the first figure by trial, and making use of the Newtonian approximation to find successive figures; namely, that if \( a \) be nearly a value of \( x \), \( a - \phi \) is more nearly so. This method becomes difficult when two roots are nearly equal; but the difficulty lies in what may be called Newton’s part of the complete method, not in Horner’s part. When the difficulty of algebra shall be conquered, the process of arithmetic may easily be amended in the trial part: but to suppose that a capital improvement in the manner of conducting computations is little worth, because it is not accompanied by a victory over difficulties of quite another kind, is as unreasonable as to quarrel with a calculating-machine because it is not an inventing-machine. This much can be said, that, with a little more trial, Horner’s method may be applied to the case of nearly equal roots; and that, as it is, it is more efficacious in discovering them than any other method.
To what is said in *Evolution and Evolution*, P. C., we may add the following remarks. 1. When the last term is positive, and 2. In the ordinary process be made negative, it is better, instead of changing the sign of the last coefficient only, to change the sign of all but the last. Thus in solving $a^n - 12a^{n-1} + 1 = 0$, the roots of the column should be $-1$, 0, 1, and 1. 2. Also that at any period of the process the divisor and dividend columns should become negative, the signs of all should be immediately inverted.

2. In the construction, it will be advisable to make the figure which comes next after the separating line correct, to continue it, in fact, till the next construction, and to use it to carry from. This has not been done in our main article (P. C.), but it is done in the instance of *Computation*, P. C. S. In that instance, the following figures, seen one over the other in the last column but one, as follows 3, 5, 7 — 6, 9, 1, — 2, 3, 2, are figures cut off by the construction, but made up from the second column to carry from the fourth.

3. If, at the beginning of the process, all the heads of the columns be multiplied by 9, the root will not be altered, and, until the construction begins, the verification by casting out nines is rendered easy, since every result in every column is divisible by 9.

We shall now show how the process works in some equations which have equal, and nearly equal, roots.

Let $x^2 - 62x + 9 = 0$, which has two roots, each equal to $\sqrt{5}$.  
-1 0 6 0 9 (1:7320)
-1 5 5 40000
-2 3 8000 1210000
-3 0 5697 5041
-4 39427 740000
-47 707 401563
-54 112409 49329
-61 115449 25190
-680 117507 1290
-683 118974
-686 11971
-689 11885

The existence of equal roots, or of nearly equal roots, might be here suspected from the slow increase of the divisor column; but the method could not verify the fact of their being two absolutely equal roots. The column preceding the divisor column being large and negative, requires us to make trial of figures above, not below, those which the divisor column seems to indicate. But nearly equal roots may sometimes be detected, as in the following instance. Let $x^3 - 10x^2 + 14x - 30 = 0$, of which it is known that one root lies between 1 and 2. The ordinary process gives

$$-7 -90 -760 -2400$$

This root may be carried on without difficulty. But at the end of the second process, when the dividend is reduced to 8000, the divisor only 8400, and the preceding column as much as $-1904$, it may be worth while to try another figure. This state of things gives a suspicion that there is another root in the immediate vicinity of the one in hand. If the three last columns be $a$, $b$, and $c$, and if we find that $pa-bc$ is nearly $c-p$, which is the trial test of $p$ being a new figure of the root, we are sure that $(p+1)$ $a+b$ will not be near $c+p+1$; and moreover $p(a+bc)+c$ has not two positive roots. But if the three last columns be $-a$, $b$, and $c$, it may very easily happen that $b+pa$ may be nearly $c-p$, and $b+pa+bc$ nearly $c-q$; for $(b-pa-c)$ has two positive roots. Perfect certainty, in the absence of an easy algebraical criterion, may be only attainable by trying every figure. In the instance before us, finding 1-41 succeed, with a presumption of a larger root, we try 1-45, beginning with

$$-7 -1940 -9400 -8000$$

This figure will not do, for a permanent difference of sign is established between the dividend and divisor columns. We then try 2, as follows:

$$-7 -1940 -4492 -984$$
$$-1954 4492 984$$
$$-1944 556$$
$$-1948$$

There is now a difference of sign between the two last columns, but, looking at the second column, we see that agreement may be restored by the next figure. The figure 8 will do it, as follows:

$$-7 -1980 -55000 -984000$$
$$-19866 -103408 -157636$$
$$-19923 -262864 -399619$$
$$-19989 -522999$$

But now 22920000 is contained more than 10 times in 399619000, which shows that 7 is not high enough. If we try 9, we have

$$-7 -1980 -55600 -984000$$
$$-19866 -135947 -214323$$

and a permanent difference of sign is established between the two last columns, whence 9 is too high. Proceed then with

$$x^9 199880 262864000 157636000$$

and we find $14325714257...$ for a root. The reader may watch the operation in the following equation:

$$2430^4 - 86467^4 + 102834^2 - 4070^2$$

the roots of which are $1-1111... 1-222...$ and $1-238...$

Whatever common figures two roots of $p^2 = 0$ may have begun with, there must be a root of $p^2 = 0$ which begins with these figures. And whatever common figures three roots may begin with, there must be two roots of $p^2 = 0$, and one root of $p^2 = 0$ which begin with those figures: and so on. If there were a difficult equation having three roots nearly equal, no method of detecting them would be easier, of all those known at present, than solving contemporaneously the three equations $p^2 = 0$, $p^2 = 0$, $p^2 = 0$, not making any step in one till all had been brought up; that is, one step of each first, then the second of each, and so on.

It may happen that a finite root is established, and yet that the process must be continued to obtain another root beginning with the same figures. For example,

$$x^3 - 46x^2 + 75x - 38 = 0$$

It will be seen in the following process that 2 is a root, with a presumption, from the appearance of the divisor column and the one before it, that there is another root beginning with 2. And by trial 2-1111... is found to succeed.

$$9 - 46 75 38 2-1111$$
$$-9 - 1221$$
$$89 8700 22$$
$$98 9779 19$$
$$1070 10867 1$$
$$1079 10977$$
$$1088 11087$$
$$1097$$

We shall now proceed to a more account of the history of this problem, and of the controversies which have existed, and to some extent still exist. For a fuller account of it up to the time of Mr. Horner, see an article in the 'Companion to the Almanac' for 1839. Before the time of Vieta, evolution consisted in the rules for the performance of division, and extraction of the square and cube roots, in forms probably derived from the East. To him [Visca, P. C., p. 315] we owe the first publication of a numerical method of finding the successive figures of the root of an algebraical equation by means of the value of the function equated to zero in the equation. This method of Vieta is in fact that which Horner's process now makes so easily practicable. If $f(x)$ be the equation, and $a$ a part of the root, it uses $f(a)$, and $f(a+1) - f(a)$ as a divisor. The process is so cumbersome, that Vieta does not attempt to apply it to equations having more than two figures in the root.

This method attracted but little attention on the continent:
but in England, where everything relating to numerical calculation has been always diligently studied, it was much noticed, and received extensions of power. In the posthumous work (1631) of Harriot (Harriot, P. C.) examples of it are given where the method had been given for reducing the labour of the ordinary extraction of the cubic root: we may mention one, which is ingenious and effective, and almost exactly a particular case of Horner's method, given by Mr. A. Ingram, in his edition of Malusio's Arithmetic, 1715, p. 560. And Mr. Horner himself refers to an edition of Melrose's Arithmetic, by Mr. Ingram (the same, we suppose) as containing such a method.

Mr. Horner's paper was read to the Royal Society on the 1st of July, 1819, and was published in the current volume of the Transactions, on the 1st of December. These dates are of importance: the publication of the above paper was the signal for more than one person to make a nibbling claim to the invention. Mr. Horner was unfortunate in two points. First, he had not sufficient knowledge of analytical algebra to be aware that his method contained the process of Vieta, and that his real claim consisted in the discovery of the beautiful process by which the labour is immensely reduced, and completely systematized. Secondly, he appears to desire to be the analyst rather than the arithmetician, and will not show anything except to those who can take all. It is true, beyond a doubt, that his method is adapted to every sort of equation, and that it is as great a help to the person who desires to solve \( x - ax = 0 \), or \( ax = x \), as to the other who wants nothing but a common algebraic equation. So far, then, it is more than Vieta's method simplified, it is the same as the method that the inventor had proceeded from simple algebra to the more complicated cases, his merit would have been more rapidly appreciated. He did not well see that his mode of solution applies as well to the integer part of the root as to the fractional; nor did he fully comprehend how much of his own discovery consisted in the general mode of calculating the value of \( x \), as given at the beginning of this article. But that we may not do him injustice, and still more that we may enable those of our readers who have not access to the original paper to see how completely he had got hold even of the most convenient analytical process, we give the solution of the famous Newtonian instance \( x^2 - 2x = 5 \). After reducing the root by 2, the heads of his columns are 1, 6, 10, and 1 (the first column, which is always vacant, he does not set down.) He then annexes either dots or cipher, and proceeds exactly as follows:

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As soon as Mr. Horner's paper had been published six months appeared "A New Method of Solving Equations," by Theophilus Hildred, London, 1819, (preface dated June 1,) 4to. The method is taken from Harriot; and a supplement is added, which gives Horner's method. Both are claimed as independent inventions, and Horner's name is not mentioned. Mr. Hildred asserts that, after having had a method for forty years, he was led to that in the supplement by a mistake he committed in solving an equation sent him by one of his subscribers. We have given, in the article of the 'Companion to the Almanac,' already cited, our reasons for coming

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* We cannot but believe that Mr. Holdred did see Mr. Horner's paper. Had he mentioned what the name of the book was, or what the book was made, &c. &c. distinctly declaring when and where he first saw Horner's paper, he might have possibly established a claim to a second inventor.
the process of diminishing the last root by one, as on the right.

Accordingly Budan has both (A) and (C) to do, where Horner has only (B). To diminish a root by 3, Budan has three processes, and so on. To diminish a root by 10, 20, &c., he divides the roots by 1, 2, 3, 4, &c., and then multiplies the resulting roots by 10; and similarly for 100, &c. It is obviously possible, by a large amount of calculation, to retain the root of an equation in this manner; but Budan is not only obliged to call in other methods, and even thus to spend very great labour, but he ends by presenting the root in the form of a sum of common fractions, each of which must be reduced to a decimal. Thus for $x^2 - 2x = 5$, he gets

$$x = 2 + \frac{1}{1 + \frac{1}{275 + \frac{1}{165922}}} = 2.004551481364$$

Budan's method is not then even of the same species as Horner's. In an appendix added to the edition of 1822, two years after Horner's paper, there is the method extended to the process for diminishing the root by $n$ (Horner's process), but no use is made of it, and singularly enough the only example given is one in which $n = 1$.

Mr. Horner ('Leybourne's Repository', page 38, of part ii., vol. v.) denies ever having seen Budan's work until 1818, after his method was finished. This, one point of view, counts for nothing; for every discoverer has a right to have it supposed that those who come after him have used his works: that is to say, he would have a right to the credit therefore arising, even though it could be shown that subsequent discoveries were made without his aid. If a partial or unfinished method turn out to have a value of quite a new character when made complete, it is impossible to deny to its author the credit of having been further than his contemporaries on the road towards the complete method; consequently Budan must have, in one sense, the merit of having prepared the particular case of which Horner afterwards made use. But, as it happens, a contemporary of Mr. Horner, in trying to insinuate that he had taken his method from Budan, has furnished independent evidence to the contrary. Mr. Nicholson, in a note to the preface (page ix.) of his essay 'On Involution and Evolution' states: 'I am informed by Mr. Dickson that about twelve months ago he (Horner) purchased at his shop, in St. Martin's-le-Grand, an 'Essay on the Numerical Solution of Equations' by Budan; at the time he mentioned that he was engaged expressly on this subject.' This called forth the preceding statement from Mr. Horner, who, had he had any unfair intention, and had he really been indebted to Budan, would have been careful not to reveal the date of Mr. Nicholson's preface in which he must have bought Budan only just time enough to insert the note about him in his paper before he sent it to the Royal Society. Instead of this, he answers in the most straightforward manner, that he bought Budan about July, 1818, nearly two years before Mr. Nicholson wrote; but avers that his method was then finished. And this we entirely believe; and also that it would have been impossible for him, fully engaged as he was in teaching a school, to have produced his method, so as to send it to the Royal Society in the spring of 1819, if he had only seen the first hint in the summer of 1818. But had he seen Budan's work, and had he then conceived the hint with which he improved, his merit would not have been the less: Lagrange, the greatest writer on equations then existing, had seen it; Legendre had seen it; and both had closely examined it, and reported to the Institute upon it. The members of the Institute had seen it. Lagrange, too, knew of Vieta's Exegesis. But no one,

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* The preface is dated May 17, 1819, and the publication took place early in July. Mr. Horner’s paper having been publicly read at the Royal Society on the first of that month.

P. C. S., No. 99.
except the Bath schoolmaster, ever brought forward Budan's method, or of a method, either from Budan, or independently, to the improvement of Vieta. Fourier had seen Budan's book, and had invented a method of his own of solving equations; or rather had given his own mode of conducting the same approximation; but this method is far below that of Horner.

We have written so much on the discovery of this method, because unfair attempts were made by claimants who had no title to any discoveries of the author, who was certainly a genius, of his rights over his own discovery. We refer to M. M. Hildred and Nicholson: though we do not believe the second was knowingly unfair. Mr. Atkinson, when he first saw the "memorandum" of the Oxford society (as some called it), saw and said that it was a capital improvement. We have written also because it can hardly yet be said that mathematicians are alive to the value of this grand completion of the system of arithmetic. The continental writers show no knowledge of it; the Oxford and Cambridge elementary works do not yet recognize its existence. The fact is, that mathematicians dislike calculation, and are apt to form hasty opinions on numerical methods before they have given them sufficient trial. The first elementary writer who brought Horner's method into instruction was Mr. (now Professor) Young, in his 'First Lessons of Algebra,' published in 1804.

In 1891, eleven years after this method was published, appeared Fourier's posthumous work on equations, containing an extended use of Newton's method. It amounts to employing \(g(x)\), \(g'(x)\), \(g''(x)\), &c., to calculate \(g \left( a + h \right)\), \(g \left( a + 2h \right)\), \(g \left( a + 3h \right)\), &c., and calculates \(g \left( a - h \right)\); and a previous calculation of \(g \left( a + h \right)\) gives assistance to that of \(g \left( a - h \right)\).

The equation \(x^2 - 2x - 5\), which Wallis happened to take as his instance of Newton's method, has always been the example on which numerical solvers have shown their power. No one can be said to have carried a method beyond those which preceded, unless he has solved this equation to more places than they have done. Fourier went to thirty-two decimal places, which we do not know that any one had done before. Some students of University College, London, and of King's College, London, and the eldest son of William Inwood, was born May 22, 1794. He was brought up by his father to his own professions. He was several years in Greece, and examined with great care the architectural remains of Athens and elsewhere, and made plans and drawings of them. He assisted his father in most of his architectural pursuits, especially in designing and constructing St. Pancras Church, and had not suffered so much as he did for many years of ill health, would have come to great eminence as an architect. His death is supposed to have occurred March 20, 1843, about which time a ship in which he had sailed for Spain was wrecked, and all on board perished.

Henry Inwood published in 1827 'The Erection at Athens, Fragments of Athenian Architecture,' &c., illustrated with Thirty-nine Plates.' The work, which consists of 163 pages exclusive of the plates (engraved by Nicholson), is printed on elephant paper of very large size, and was published by subscription. He had also commenced a work entitled 'On the Resources of Design in the Architecture of Greece,' which was never completed, and was about to publish 'The Architecture of the Architects of those Countries from Nature,' 4to. London, 1834, with explanatory engravings. Two parts were published, one to ill health, and the work was never completed. He collected many fossils and remains of antient art, most of which are now in the British Museum.

CHARLES FREDERICK INWOOD, second son of William Inwood, born November 28, 1796, besides assisting his father in his works, was the architect of the church of All Souls at Great Marlow, in Buckinghamshire, which was completed in 1835. He also built the St. Pancras National School, in Southampton Street, Euston Square, a large plain brick building of little architectural pretension. He died in May, 1840, aged forty-two. St. Pancras Church, New Road, London, which was the joint work of William Inwood and his son Henry, is in its kind and in its peculiar beauty unique among the churches of the metropolis. The building was commenced July 1, 1819, and completed May 7, 1822; and cost 76,760l. The exterior of the body of the church is, with certain necessary deviations, an imitation of the Ionic temple called the Erechtheum on the Acropolis at Athens (Eræctereion, P. C.), which tower is the acropolis, and the lower part of the Tower of the Winds, also at Athens, which is properly the Horologium, or water-clock, of Andronicus Cyzicetus. The measurements and drawings of these towers were those of Henry and Charles Inwood, as the peripatus of its south entrance requires attention to his request when he says, speaking of the antagonistic claims which had started up—"All I ask of them [mathematicians] in recompense for the facilities consigned to their use is a non-figured method, in toto near in mind that I alone am the author of it." And we have no right, whatever, and are willing to stake our credit upon it, that the inferences of the higher mathematicians in matters of computation is overcome, and when the mode of solving equations has attained the same schoolboys as the name of Horner will be one of the household words of pure arithmetic, and himself looked upon as one of the greatest of its modern benefactors. Justice requires that his name should remain attached to the process, as he so man of the mathematical science, as the name of Henry.
buildings which project from each side of the east end, forming the entrances to the catacombs of the church, are adaptations from the south porch of the Pandrosion. The caryatid figures, of which there were six, four in front and one at each side, were in the place of columns, and supported the principal cornice of the north portico of the building. There is one of the original caryatid figures in the Elgin Room of the British Museum. The sarcophagus beneath each caryatid was its purpose for which the projecting buildings had been constructed. The two Ionic half columns engaged in the walls on both sides of the west end are additions made to form an apparent basis for the caryatids. The entrance near the rear of the church connects with the front of the doors. Grecian temples had no windows; large temples had a central portion of the roof open to the sky; small temples generally received light only from the door, which was wide and lofty. The octagonal tower, with its two ranges of eight columns each, in its form and general effect, combines well with the building and portico, and is in itself an object of peculiar beauty. In the interior the galleries are supported by very elegant slender columns. The ceiling is flat, and formed into a number of ornamented panels. The general effect of the interior is good, though rather deficient in light, especially below the galleries, from the height of the north porch.

The Westminster Hospital, near the west end of Westminster Abbey, was built by William Inwood in conjunction with his son Charles. It was begun in 1822, completed in 1826, and opened in 1827. The material is grey Sullivick brick, with stone facings. It is quite plain except the front and the truncated angles which connect the front with the two ends. The front extends across the road, the height of the building is one story plus a attic, which projects slightly and is a story higher than the two wings. The entrance is by a flight of stairs beneath a large stone porch constructed in three divisions with flat pointed arches. The ground floor and the first floor are the same, with four windows on each side. Above the porch is an oriel window which extends to the height of the two upper stories; and at each of the truncated angles is an oriel window similar to the one over the porch. The flat windows are deeply indented, and are divided into four equal compartments by a mullion and transom, but the two upper compartments are distinguished from the two lower by trefoil tracery at the tops, and each window is surmounted by a weather-moulding. There are in all 200 windows. The brick harmonizes well with the stone portico and dressings, and the general appearance of the front is very handsome. Perhaps the battlemented parapet may be objected to as inappropriate to the purposes of the building, and as less handsome than a parapet of open work would have been, similar, for instance, to that of Westminster Abbey in the north transept, etc. But the parapet occupies the place of the old basement. The interior arrangements and ventilation are excellent. There are 19 wards and about 250 beds.

The dome, which was built, the Regent Square Chapel, opened in 1826; the Camden Town Chapel, opened in 1824; and Somers Chapel, in Seymour Street, opened in 1826, all of which are chapels of ease to St. Pancras Church. He also built numerous other structures, mansions, villas, barns, warehouses, &c.

(Written Communication; Companion to the Almanac; Knight's London; Elgin Marbles, in Library of Entertaining Knowledge.)

IOWA, a territory of the United States of North America, is bounded on the west by the Missouri river and the White Rock river; on the east, by the Mississippi and Des Moines rivers; on the south, from sources of the Mississippi to the Lake of the Woods; on the north, by the parallel of 49° N. lat., which separates it from the British possessions; on the south, by the parallel of 40° 30' N. lat., which separates it from the State of Missouri. The area has been estimated at 200,000 square miles, which is nearly four times the area of England, exclusive of Wales.

Of the northern part of the territory a very large portion is occupied by a vast extent of high ground, called the Coteau des Prairies, which commences about 48° N. lat., and terminates about 43° N. lat., extending in width more than fifty miles, and in length more than two hundred miles, of which, it is said to rise more than 1000 feet above the surrounding country, has generally a rounded surface, with few irregularities, and is for the most part destitute of trees. East of the Coteau des Prairies is an extensive valley, in which the Red River runs northward to Lake Winnipesaukee, and the St. Peter's River south-east and then north-east to the Mississippi. West of Coteau des Prairies is a broad valley of prairie land traversed by the James River, and this valley is separated from the Missouri by a high range of ground similar to the Coteau des Prairies. The area of these two north-valleys has been estimated to be more than 1000 feet above the level of the sea. The rest of the country between the Missouri and the Mississippi contains no mountains nor even hills of large size, but consists of rounded slopes with broad valleys in which rivers flow, the upland tracts being connected with the valleys by gentle slopes. Belts of forest are found near the rivers, and large prairies amid the woods and prairies of the territory. The Coteau des Prairies and the Missouri, but the rest of the country either consists of prairies or is covered with brushwood. The south-east part of the territory, which is only part of which the settlers are numerous, and where the lands have been sold by the federal government, is generally undulating, interspersed with timber-lands and prairies, and abounding in springs and streams. This tract, which is very fertile, extends from the Des Moines River south to the Turkey River north, and westward from the Mississippi fifty or sixty miles to the Indian boundary.

In Iowa there are numerous rivers, which rising in the elevated grounds on the north-eastern part of the territory, respectively eastward into the Mississippi, westward and southward into the Missouri, and northward into the British possessions. Those which flow into the Missouri are comparatively small, the Des Moines River, the Big Stone, the Maquoketa, and the Turkey River. The Des Moines River flows in a south-westerly direction, upwards of 400 miles, and falls into the Missouri where that river flows to the east some distance below Grand Detour. Of the rivers which fall into the Mississippi, one of the largest is the Big Stone Lake, which has its source in the Blue Earth, and one of the largest is the Cedar River, the Wabashipenee River, the Great Macquodie River, the Turkey River, and the Upper Iowa, are also rivers of large size. Of the rivers which flow northward the Red River is the largest; it rises in the same valley as the St. Peter's River, in Lake Travers, which is near the Big-Stone Lake, and has a course of from 300 to 400 miles northward before it enters the British possessions, through which it flows to Lake Winnipesaukee. In the most northern and north-eastern part of the territory, though the elevation above the sea is not much less than 1000 feet, the country is much lower, and the lakes are larger and the islets more numerous, the lakes. There is a lead-mine district in the south-eastern part of the territory, and considerable quantities of the metal are obtained. There are no towns yet of sufficient size to require description; the largest are Burlington, Bloomingg, Iowa city, Davenport, and Fort Madison. There is a newspaper published at Burlington. Iowa, the capital, is in 41° 28' N. lat. and 93° 49' W. long. from Washington.

Iowa was constituted a territory by an Act of Congress, dated June, 1838, and the government commenced July 4, 1838. It was then divided into sixteen counties, and the population, according to the census, was 22,859; in 1840 the population was 43,112; in 1844, it had become 81,929, a rapidity of increase probably exceeding that of any other state or territory in the Union. The legislative power is vested in a governor, a council of 13 members elected for two years, and a house of representatives consisting of 26 members elected annually. The governor's salary is 2,000 dollars a year, and he is a secretary who receives 1,200 dollars a year. The members have three dollars a day, and three dollars for every twenty miles of travelling. There are three judges, who are appointed for four years, and who each receive 1,500 dollars a year. The territory is divided into three judicial districts, in each of which the judges perform circuit duties; the supreme court, composed of all the judges, meets annually in July at Iowa City. Congress voted 50,000 dollars for the building, and 20,000 dollars at the seat of government, for which Burlington was first chosen, but it has been since fixed at Iowa City, where the legislative assembly meets annually on the 1st of December. Congress voted also 5000 dollars towards the purchase of a
terrestrial library. The territory sends one member to the House of Representatives.

On the 5th of April, 1844, the people of Iowa passed a vote, by a majority of 2,400, for forming the Territory into a State, which they were entitled to do when the population reached 12,000. A convention met in Council Bluffs, formed a state constitution, afterwards submitted it to Congress, and claimed to be admitted into the Union as a State. A law was passed by Congress for that purpose, March 5, 1845, which fixed the boundaries of the State thus:—From a point on the Des Moines River to a parallel of latitude passing through the mouth of the Munkato, or Blue-Earth River; thence west along this parallel of latitude to where it is intersected by a meridian running in a north and south direction, 82° W. from Washington; thence due east along the northern boundary-line of the State of Missouri; thence east along that boundary to where it intersects the Des Moines River. The Blue-Earth River falls into the St. Peter's River near the point where the St. Peter's changes its course from south-west to north-east. The boundaries fixed by Congress not only very greatly reduced the size of the Territory, as was expected, but differed so materially from the boundaries proposed by the convention, that the people of Iowa refused to be formed into a State on the conditions laid down in the Act of Congress, and Iowa therefore remains still a Territory.

The quantity of public lands sold in Iowa from 1838 to 1844 (but including only the two first quarters of the latter year) was 1,402,624 acres, which produced to the public treasury of St. 1,920,420 dollars, which is rather more than a dollar and a quarter per acre. There are still a great many squatters.

The inhabitants of the Territory of Florida had applied for admission to the Union as a State, in January, 1830, but the application was not granted till March 3, 1845, when it was constituted a State by the same Act which would have admitted Iowa. Florida made no objection to the terms of admission, and is therefore now one of the United States of North America. A sketch of the new constitution of Florida and other particulars is given under UNITED STATES OF NORTH AMERICA, P. C. S.

I. versicolor, Blue Flag, has sword-shaped striated leaves sheathing at the base, a stem two or three feet high, round on each side, the other, and the six flowers. This plant is a native of swamps and wet meadows in the United States. The rootstock has a nauseous acrid taste. It acts as a cathartic, and its action is attended with great depression of the nervous system and prostration of strength. It also acts upon the kidneys, and is useful in cases where diuretics are indicated.

I. pseudacorus, Yellow Flag, has sword-shaped leaves; the stem round; perianth divided into its inner segments narrow and shorter than the stigmas. It is a native of wet places in Great Britain, France, Germany, and most countries of Europe. The rootstock is acrid and possesses an emetic and cathartic action. The roots when roasted are said to form a good substitute for coffee.

I. Florentina, Florentine Iris, has broad and somewhat falcate leaves shorter than the stem, the petals two inches long, broad at the base and rather pointed towards the base. The dried rootstock is known in the shops under the name of orris-root. The plant is a native of the southern parts of Europe and the islands of the Mediterranean. The rhizomes have a slightly acid and subacid taste, and is employed as a demulcent. It enters into the composition of Ruspini's tincture and tooth-powder, and other medicaments. It was a time used as an ingredient and admixed into the British Pharmacopoeia. The fresh rootstock acts as a purgative, and was also employed as an expectorant in disease of the chest. When dried and turned into small balls it is used for issue-pegs. According to Sub- thorp, this plant is found in Greece, and is also an emetic. It is the Iphe of Hippocrates (Morg. Mal., 2, 673) and the Ipsi ( Dioscorides (Hist. Plant., 7, 12). I. jactilis, Stinking Flag, has sword-shaped leaves, the stem round and distinctly heart-shaped, its inner segments about as long as the stigmas. This plant is a native of Great Britain and other parts of Europe. It has a peculiar smell, which some have compared to roast beef, which is used to wash others in the same manner. Aloe is the Lapis of Theophrastus (Hist. Plant., 9, 8) and the Esopus of Dioscorides (4, 12). I. rubra is the sword-leaved species, the segments of the perianth usually furnished with a purplish or red border, and never with a hollow in the middle of the auricle. The leaves are always green in the field. All these species are cultivated in gardens on account of handsome showy flowers.

(Trank, Synopsis Florae Classicae; Lindley, Flora Medicæ; Sibthorp, Flora Græcæ; Bienington, Manual of British Botany; Burnett, Outlines of Botany.)

IRISH MOSS. [Cladonia, P. C. S.]

IRON BOATS AND SHIPS. [Ship-Building, P. C. P., p. 305.]

IRRADIATION denotes, properly, the emission of rays from a luminous body, the rays being made use to signify an apparent enlargement of the disc of a celestial body; this being caused either by a deviation of the rays of light from a rectilinear direction, or by some illusion arising from the action of light on the eye.

When rays of light from points at the surface of an object fall on the retina, there may be produced on the latter an agitation extending within short distances about the points to which they are directed; the plexuses are made use to convey by the humours of the eye: hence there may arise a perception of a fringe or border about a luminous body, and consequently an apparent enlargement of such body. Thus the image of a star, when seen by the eye, appears to be a disc of sensible magnitude, instead of a mere point; which, on account of its remoteness, would be the case if the rays of each pencil produced no effect beyond their mathematical point of convergence; the disc of the sun or of the moon is conceived to be, in like manner, apparently enlarged; and thus, also, the part of the moon which, when the latter is nearly new, is enlightened by the sun, appears to be a portion of a sphere of greater diameter, than it really is, which is more faintly enlightened by the rays reflected from the earth.

A species of irradiation is caused by the blending together, upon the retina, of the circles of light produced by the pencils which fall on the point, and which are thus converted into a round spot; the humours of the eye not permitting that convergence to take place exactly on the membrane.

ENLARGEMENT OF OBJECTS, P. C. S.

Before the invention of telescopes, the apparent magnitudes of celestial bodies were very erroneously estimated; thus, Tycho Brahe made the diameter of Venus twelve times, and Kepler made it seven times as great as it is now known to be. Telescopes do not entirely remove the cause of such error, but, by diminishing the apparent brightness of the bodies, the error in the estimation of their apparent magnitudes is proportionally diminished. De Sèjour, Lecell, and other astronomers, on the contrary, have calculated the diameters of the sun and moon in eclipses of the former, and have, in order to produce an agreement between them, found it necessary to diminish the apparent magnitudes of the sun and moon by 4° 13' each; on the other hand, it is supposed, of the effects of irradiation.

It is a consequence of irradiation, that objects which are in reality of such apparent magnitudes as are according to their colour or to the quantity of light which falls upon them. Sir William Herschel remarked (Phil. Trans., 1783) that when a bright circle was viewed together with a dark one, the light brightened the dark circle, and appeared smaller than the other; and, in order to correct the erroneous estimate of the magnitudes of the objects seen through telescopes when they are seen against a bright ground, it appears
that the antenates made the thickness of the columns to increase proportionally to the distance between them. The reason assigned for this practice by Vitruvius (De Architectura, lib. 3, cap. 2) is that the columns with wide intervals, being more exposed to the wind, are less subject on that account to be more slender: it must be observed, however, that the perceptions of magnitude depend partly on those of distance; and a contrary effect frequently takes place with objects viewed against the sky when conceived to be more remote than they really are.

ISATIS. (Weal. P. C.)

ISCHYODUS, a genus of fossil fishes included in Chimeran Asiatische.

ISNARDIA, a genus of plants named by Linnaeus in memory of M. Antoine Dante Isnard, member of the Academy of Sciences. It belongs to the natural order Oenogaraphe, and has 4-9-10 calyx, 4 petals, 8 stamens, and a filiform style, with a clavate or cruciform stigma. There is one British species of this genus. I. palastris has a procumbent rooting glabrous stem, opposite ovate acute leaves, terminating in a petiole about 5 cm. long, with minute, sessile, yellow fruits, and a white, 8 mm. petal.

It is found in pools and marshes in Europe, Siberia, and Persia, and in Sussex in England.

I. alternifolia has an erect branched stem, alternate leaves, rather scabrous on the margins, and hoary beneath. It is a native of Virginia and Carolina, in marshy places, and has oval yellow petals. The root is used as an emetic, and is called "Dronkheem." None of the species of this genus possess qualities which entitle them to cultivation except in botanic gardens. They may, however, be reared in a hot-bed, and then planted in an open bed or borders. (Don, Gardener's Dictionary; Babington, British Flora.)

ISOCROMATIC LINES are those coloured rings which appear when a pencil of polarized light is transmitted along the axis of a crystal, as mica or nitre, and is received in the eye after passing through a plate of tourmaline. If a plate of nitre having its surfaces perpendicular to the axis of the nature, is placed between two plates of tourmaline having their axes at right angles to one another, and a lens of short focus be placed so as to transmit the light of the sky through the plates to the eye of the observer, that focus falling a little below the surface of the nitre, the rays of light will be polarized by passing through the first plate of tourmaline, and there will be seen a series of oval rings, each of which is formed from a figure which may be considered as resembling lemniscates. By the nature of the lemniscate, the rectangle contained by two lines drawn from the poles to any point in the curve is constant. The explanation of the circumstance that the tint of any one is represented by the equivalent of such rectangle for that curve: when the light is viewed through plates of nitre of different thicknesses, the tint varies.

The curves are conceived to exist on the surface of a sphere of which a point in the crystal is the centre; and when the optical axes of the crystal are at a considerable distance from one another it is possible, projecting on one plane, the tint in each curve will depend on the product of the sines of the angles subtended by two lines drawn from the poles to a point in its periphery, and also upon the length of the path described by a ray of light passing through them.

ISOCRINITES, a genus of Crinoidea (Goldfuss).

ISOSTES (from I so, equal, and I stes, year), a cryptogamic genus of plants, belonging to the natural order Lycopodiaceae. The capsule of a plant does not open, and the fructification is enclosed within the swollen base of the leaves; it has spores of two kinds, which are attached to filiform receptacles. The organs of fructification in this plant are small cases, which are situated in the angles formed by the union of the leaves and the contracted stem; those seated in the axil of the outer or inferior leaves are divided into three cavities, containing about fifty spherical bodies (granales); the cases in the axil of the inner or superior leaves are divided by numerous transverse partitions into many cavities, all of which are filled with an impalpably fine powder, in the early stages of its development, and gradually becoming black.

The species of Isostes grow at the bottoms of ponds and lakes, and are said to afford excellent food for fish. They are called Quillworts from the rush or quill-like appearance of the leaves.

I. lacustris, Quillwort, has subulate roundish-quadrangular leaves with four longitudinal jointed tubes. The rhizome of this plant is a blunt tuber; the leaves are slender, broad and flat at the base, but elsewhere cylindrical and quadrangular. It is found in Great Britain, at the bottom of lakes and pools. I. Lycopodioides, a plant of the same family, resembles this species, with, however, a much more expanded stem and leaves. The identity of the plant, and other species of the genus, is only imperfectly understood. It is on this account referred to Marigilliaceae by some authors, and made to form an independent order. Others follow the author of Lycopodiaceae, and other plants, 'I follow De Candolle and Brongniart, in referring it here. Delile has published an account of the germination of Isostes lacustris, from which it appears that its spores sprout upwards and downwards, forming an intermediate solid body, which ultimately becomes the stem or cormus, but it is not stated whether the points from which the ascending and descending axes take their rise are uniform; as no analogy in structure is discoverable between these spores and seeds, it is probable that they are not. Delile points out the great affinity that exists between Isostes and Lycopodium, particularly in the relative position of the flowers of the two kinds of reproductive matter. 'In Lycopodium,' he says, 'the vegetative shoots occupy the upper ends of the shoots and the granular thecae the lower parts; while in Isostes the former are found in the centre and the latter at the circumference. If this comparison is good, it will afford some evidence of the identity of nature of those thecae, and that the pulverulent ones are at least not anthers, as has been supposed; for in Isostes the pulverulent individuals of the male have the same external appearance, the presence of what has been called its stigma, as the outer granular ones; so that if Isostes has sexes, it will offer the singular fact of its anther having a stigma.' (Babbage, British Flora; Heywood, History of British Ferns; Lindley, Natural System; Burnett, Outlines of Botany.)

ISOTELUS, a genus of fossil crustacea (Thysicera) from the Silurian strata, especially of North America.

ISSUE PEAS are round bodies employed for the purpose of maintaining irritation in a wound of the skin which is called an issue. (See P. C.) It is a matter of indifference of what substance they are made, as long as they do not introduce poisonous matters into the wound. The seed of the common garden pea is frequently used. It is however more common to use the young unripe fruits of the common orange (Citrus aurantium). The fruits are dried and afterwards turned in a lath before they are used as issue pease. The unripe oranges, dried, are sold under the name of orangeetas or Curcum orangeas. The rootstock of the iris Filumens is also flooded into peas and used for keeping up the discharge from issues.

Lindley, Flora Medica; Christian, Dispensatory.

IULUS, a genus of fossil scaphopoda (Triphora) from the Miocene strata, as now form the order Chilognatha (χιλόναθος), the first division of Myriopoda in the arrangements of Leach and Latreille. The Chilognatha have crustaceous and usually transparent bodies, of the form of a leaf, or a book. The valves are very short feet, each terminating in a single book; a vertical rounded head, furnished with two mandibles, which are either thick and robust or united with the labium and elongated. The eyes have no palp. The valves are very short, either slightly thickened towards their extremities, or filiform throughout, and composed usually of seven, more rarely (as in the genus Sphaeropus) of six joints. Their eyes are smooth and very greatly in number. These animals move slowly and with a gliding motion. When disturbed, they roll themselves up spirally, or into a ball. They feed on decomposing animal and vegetable matter. The position of the Chilognatha at the head of the Myriopoda, by Latreille and others, has recently been disputed by Professor Brandt and by Mr. Newport. The following remarks on this subject by the latter naturalist, of all living zoologists, the most competent to decide in questions affecting this difficult class, are taken from his catalogue of Chilognatha in the British Museum, published in the 'Annals of Natural History for April, 1844,' and afford in a brief compass much information concerning them. 'The Chilognatha have usually been regarded by naturalists as the first order of Myriopoda, partly in consequence of the larval structure, and partly from the general form of their bodies being similar to that of the larve.' This was the view taken of these animals by Latreille, Leach, Gervais, and others, and very recently by Lucas. But different and, as I believe, more correct view and arrange-
ment have been followed by Professor Brandt, who regards the Chilopoda as the first, and the Chilognatha as the second division of the class. Although I cannot entirely agree with Brandt that the Chilopoda have the mammalian in their massing and sucking species, because, as Lucas has recently remarked, there are species even among the Chilopoda which have the external organs of nutrition fitted only for sucking food, I find, as he does, that they form with him in the superiority of the Chilopoda, as an order, over the Chiliognatha, notwithstanding the less compact structure of the head in the former. The general opinion is certainly right that they are the most perfect animals of the class Articulata. The more compact frame of body, the reduced number of the organs of locomotion, the greater part of the body in the form of the legs and the presence of the higher species, approximate the Chilopoda to the predestined insects on the one hand, and to the Arachnida on the other. The form of the head, in the two divisions of Myriopoda, seems to have reference chiefly to the particular species. Thus, in those which seize their prey and subsist like the Arachnida on living objects, those segments which in reality compose the whole head are not all anchylosed together, but are in part freely movable on each other, and thus allow of a more prehensile function to the large forcipate foot-jaws, the true mandibles of the Arachnida. Some naturalists have believed that those foot-jaws in the Chilopoda are not true mandibles, but 'Chilognatha'; but I am satisfied, by recent examinations, that this is truly the case.

In the Chilognatha the foot-jaws have the form of true mandibles, because the habits of the species require that compact form of the head. In this respect alone can the seizing and piercing of living prey, but to the grinding or comminuting of more or less solid vegetable matter, on which most of the genera of Chilognatha entirely subsist. In all other respects, both in their internal as well as their external anatomy, and in their physiology and mode of growth, the Chilognatha are decidedly inferior to the Chilopoda. They seem to conduct us down to the Annelida from the vegetable-feeding annelids, and thus the Chilopoda do from the Arachnida to the same class.'

The Chilognathous Myriopoda are found in all parts of the world, and certain genera, however, affecting certain geographical divisions. Thus the species of Gomphodes are European; those of Spiractreps and Sphararheus African and Eastern. The genus Tylus, in its most limited sense, includes European, Asiatic, and North American species. Tylus terrestris is a familiar British example.

A synopsis of the genera of Chilognatha will be found in the third part of the nineteenth volume of the 'Linnean Transactions,' appended to a valuable memoir on the Myriopoda by Mr. Newport. Professor Brandt's papers on these animals are published in the 'Transactions and Proceedings of the Imperial Academy of St. Petersburg.'

Mr. G. A. Robinson, the mathematician, was born at Dundee, in 1785, and received the rudiments of education in the public schools of that town. At fourteen years of age he was sent to the university of St. Andrew's; his father, who was then a watchmaker, not to become a clergyman of the church of Scotland. In that university the young man remained six years, during four of which he was occupied with the study of mathematics, languages, and philosophy; but the first of these subjects, from a natural inclination to that branch of science, particularly engaged his attention; he was encouraged and ably assisted in his favourite pursuit by the Rev. John West, one of the instructors at the university; and his great progress, which is said to have excited considerable notice, gave already indications of the eminence which, as a mathematician, he was afterwards to attain. The two following years were passed in the study of theology, and Mr. Robinson then went into partnership and company with Mr. (afterwards Sir John) Leslie, who had been his fellow-student at St. Andrew's, to the university of Edinburgh, where the latter spent one year in completing the course of agriculture which had been deemed necessary, as a preliminary to admission to the office of minister in the church of Scotland.

It is not known what circumstances prevented Mr. Ivory from pursuing a profession of the law. In this respect; but, on quitting the university, in 1768, he accepted a situation as the assistant of a bookseller. He entered an establishment in Dundee, and continued to fulfil the duties of that post during three years. At the end of that time he engaged with some other persons, and established himself in Forfarshire, a factory for spinning flax; and of this association he appears to have been the principal person.

During fifteen years (from 1789 to 1804) Mr. Ivory was employed daily in operations apparently very uncongenial to the taste of a man of science; but it may be presumed that all his leisure hours were devoted to the prosecution of scientific researches, seeing that during this time, that, though residing in a retired district, he diligently cultivated the friendship of the English mathematicians, together with those of the illustrious foreigners whose works were in the public libraries of Scotland. Mr. Ivory obtained access to, and made himself thoroughly acquainted with, the later productions of the continental mathematicians.

It is scarcely to be expected that a factory carried on under the supervision of one of the principal manufacturers of his time was probably spent in researches which require nearly a total abstraction of the mind from the ordinary concerns of life, have should succeeded; accordingly we find that in 1804 the company ceased to exist; and Mr. Ivory, who then obtained the appointment to a professorship of mathematics in the Royal Military College, quitted Scotland, and went to reside at Marlow, in Buckinghamshire, where that institution had, a few years previously, been formed. On the removal of the college to its present site (Sandhurst in Berkshire), Mr. Ivory accompanied it to the latter place, where he remained till his retirement from public service. He fulfilled the duties of his office with energy and success, his attention to the students who were placed under him was unremittent; and it should be remarked that, however irksome it might have been to a man of high attainments in science to submit to the routine of the day of a military professor. Mr. Ivory always evinced the utmost readiness to assist, by the most appropriate and familiar illustrations, in smoothing the path of science to his pupils. An edition of Eudoc's Elements, which is known to have been his work, though his name do not appear on the title-page, was prepared by him for the use of the students in the college; and the manner in which he has treated the book on proportion, and those which relate to solid, must have greater merit with all the connoisseurs which the generality of learners experience in acquiring a knowledge of those parts of elementary mathematics.

In the beginning of the year 1819 Mr. Ivory, feeling his health decline under the great exertions which he made in carrying on his scientific researches and performing his duties as a professor, those duties leaving him but short intervals of leisure, was induced to resign his professorship and retire into private life. In consequence of his great merit there was granted to him the pension due to the full period which, by the regulations, the civil officers of the institution are required to serve previously to obtaining such pension; and which period he had not completed. After his retirement from Sandhurst, Mr. Ivory devoted himself wholly to scientific researches, and the results of his labours have been printed in a little periodical of the 'Philosophical Transactions.' In 1831, in consideration of the great talent displayed in his investigations, he was by Lord Brougham, to whom he had been known in early life, recommended to the king (William IV.), who, in the following year, placed him as a member of the Royal Society, gave him an annual pension of 900L., which he enjoyed during the rest of his life; and, in 1839, the University of St. Andrew's conferred on him the degree of doctor in laws. He lived in great private in or near London till the time of his death, which happened September 21st, 1842, in the seventy-seventh year of his age.

Mr. Ivory's earliest writings were three Memoirs which he communicated in the years 1796, 1799, and 1802, to the Royal Society of Edinburgh: the first of these was entitled 'A New Series for the Rectification of the Ellipse,' the second, 'A New Method of resolving Cubic Equations'; and the third, 'On the Third and Fourth Problems of Elliptick Sections.' All of these works displayed a great originality of thought. He contributed fifteen papers to the 'Transactions of the Royal Society of London,' nearly all of them relating to physical astronomy, and others to the mathematical investigations of the most refined nature. The first, which is entitled 'On the Attractions of Homogeneous Ellipsoids,' is to be found in the volume of 1806, and contains investigations of the attractions of such ellipsoids as are surrounded with them and on their exterior; the former case presents few difficulties; but the process used by Laplace for the solution of the latter was very complicated, and the merit of discovering one which is remarkable for its simplicity. A given point being on the exterior of an ellipsoid, he insta-
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JACARANDA of commerce is said by Prince Maxi-
million to be the timber of a Brazilian Mimoso.

(Burnett, Outlines of Botany.)

JACKSON, JOHN, R.A., was born in 1778 at Lasting-
hurst, in Hampshire, where his father was a tailor, and he was himself bred to the same business.

He however hated his occupation; he had seen the collection of Lord Malgrave, and the pictures at Castle Howard, and he had made an ambition to become a painter, a form of which he made to imitate a picture by Reynolds was shown by his schoolmaster to Lord Malgrave, who perceive in it and others, notwithstanding their crudeness, some talent, supplied Jackson with proper materials, and encouraged him to go on. Lord Malgrave and Sir G. Beaumont purchased the two years of Jackson's unexpired apprenticeship, and the latter in 1797 gave him an allowance of 50l. per annum, and an apartment in his house in town, to enable him to prosecute his studies at the Royal Academy.

Jackson soon obtained a name for his portraits in black lead-pencil and water-colours, but it took him many years to equal the successful oil-painters of that day. He first attracted notice in this department about 1806, and in 1817 when he was elected a member of the Royal Academy, his reputation was little inferior to that of Lawrence, though he was comparatively little patronized; his portraits were bold and effective, but they wanted the dexterity of the works of Lawrence: Jackson could paint five heads while Lawrence was painting one. In the summer of 1819 he visited Rome in company with Chantrey, and painted for him there a portrait of Canova. Jackson astonished the Roman painters, says Cunningham, by copying in four days the Borghese Titian of Sacred and Profane Love as it is called, a picture which many men have required more than three month to copy; Passavant says, the figure of Divine Love, in three days, which is more likely; the rest of the picture is scarcely worth copying.

Jackson was elected a member of the Academy of St. Luke, at Rome. He was in all his works extraordinarily rapid and sure. A story is related, that he commenced and finished in a single summer's day, as a wager, the portraits of five gentlemen; he received 25 guineas for each of them—125 guineas in one day; probably no painter ever earned as much by his own labour before. The story is told by Passavant. Jackson died at his house in St. John's Wood on June the 1st, 1861. His best works are the portraits of Lady Dover, of Flaxman, and of himself, both painted for Lord Dover, and the portrait already mentioned of Canova. He painted in all the portraits of thirteen of his fellow Academicians, but that of Flaxman, is in all probability the best. All the shallow observers will see in this picture, that there is a 'sombre grandeur about it which awes one', it is certainly one of the finest portraits in the world.

Jackson exhibited in all, at the Royal Academy, between the years 1804 and 1830, one hundred and forty-five pictures, of course painted very many portraits that were not exhibited, for he was latterly constantly employed. His nominal price for a head was fifty guineas, and though he must have been making a large income, he died without leaving a provision for his family. He was twice married; his second wife, who survived him, was the daughter of his fellow-academician, Ward.

(Cunningham, Lives of British Painters, &c; Passavant, Kunsträtsche durch England, &c.)

JACKSON, ANDREW, the late American general and president, was himself a native of the United States; although his father, of the same names, was an Irishman, the youngest of the four sons of Hugh Jackson, a linendraper near Carrickfergus; and either the linen-drawer himself, or one of his recent progenitors, had come over from Scotland. Andrew Jackson was born in 1767, and is said soon after to have been a member of a band of wanderers, who after various adventures, had taken possession of a farm near Pontic, North of Ireland; Monree, Jackson, and the present President, Polk. (1846)

Andrew, her latest born, appears to have been his mother's favourite; and the original destination of the future General and President of the United States was to be a clergyman, we are not informed of what denomination. With this view, after having for a short time attended school education, he was sent to the Waxlaw Academy; and here he studied theology for some years. When the war of independence, however, made all Americans soldiers, the young Jackson seems to have taken a quick advantage of the situation in which he found himself, and his army career was so rapid that he fought, along with his next oldest brother Robert, under Sumter in his attack on the British garrison at Rocky Mount, on the 6th of August, 1780; at which date he would be little more than thirteen. And from this time he is stated to have taken a part in the campaigns as long as the war lasted. Nor did he altogether escape the usual dissipated habits of a military life; but, with the decision of character which was his most remarkable characteristic, he suddenly changed his course before it was too late, and, collecting what remained of his means, put himself, in the winter of 1784, into the hands of Spruce Mc'Gay, Esq., an eminently active and afterwards a judge, to be instructed in the practice of the law. This new study he prosecuted with so much success that in 1787 he was appointed solicitor for what was then called the Western District of North Carolina, and is now the State of Tennessee. The circumstances of the time, however, did not suffer him, even if he had been so inclined, to throw off his military character, or to let the experience he had gained in camps and campaigns go to rust. Although the war with the mother country was over, the borders of the republican territory were still infested with another most troublesome enemy in the original occupants of the soil; and Jackson, although he would only serve as a private, is said to have so much distinguished himself, that he was in a very short time elected a member of the State convention as a delegate from the county of Tennessee.

He was chosen a member of the State convention, and in the year 1789, he was chosen a member of the State convention, and in the year 1790 became a member of the State legislature, and was chosen a member of the United States congress. He was chosen a member of the United States congress. He was chosen a member of the United States congress. He was chosen a member of the United States congress.

He continued to be thus employed till the year 1796, when, after having first acted as one of the members of the Convention for establishing a constitution for the state of Tennessee, he was, under that new arrangement, elected to a seat in the House of Representatives. The next year he was chosen a Senator; but he resigned his seat after holding it for one session. On this he was immediately appointed by the legislature of Tennessee Judge of the Supreme Court in that state; having also been shortly before chosen a Major General of the state forces. But he soon resigned his judicial office; and, settling himself on a farm, a few miles from Nashville, on the banks of the Cumberland, he remained retired, living out of the war with England in 1812. With that event commences the most memorable portion of Jackson's career.

His first command was that of a body of between two and three thousand volunteers, who had assembled for defense, and with whom he was directed to proceed down the Mississippi for the defence of the lower country, this was in November, 1812. The next year he greatly distinguished himself by a campaign against the Creek tribes. An account of it may be found in a message from the President (Madison) to Congress, dated 7th December, 1813, in which it is stated that the best hopes of a satisfactory issue of the contest were already warranteed by the complete success of a well-planned enterprise against the Indians, executed by a detachment of the volunteer militia of Tennessee under the command of General Coffee; and by a still more important victory over the larger body of them, gained under the immediate command of Major General Jackson, an officer equally distinguished for his patriotism and his military talents. The Creeks were repeatedly afterwards defeated by Jackson. The boundaries of the territory were determined in the year 1813, by which they agreed to lay down their arms. (Message of President Madison, dated 20th September, 1814.)

In 1814 Jackson was appointed a Major General in the service of the United States; but he resigned his commission after, and, in the course of other operations, he succeeded in taking Pensacola on the 7th of November, and raised himself to the highest point of reputation and popularity among his countrymen by the famous victory at New Orleans, on the 8th of January, 1815. The next military command which he held, that of
the war against the Seminole Indians of Florida in 1818, for the
purpose of seizing territory which previously belonged to the
Monroe's Message to Congress of the 16th of November in
that year, and to the Report of the Committee of Senate on
the Seminole war, dated 24th February, 1819. Jackson's
presentation of the same, in the Senate, was not irregular and high-handed; the force at the head of which he
placed himself was raised and officered not only without but
in direct opposition to the orders of the general government;
in particular, he had his own men, not the men he had been
ordered to seize, one after another, several forts and ports be-
longing to Spain, with which country the United States were
at peace, and to put down the Spanish authorities by the power
of the United States. Jackson had been warned of the disapproval in the most emphatic manner, by the immediate
restoration of the places thus unwarrantably seized; but his
extraordinary act was the execution of the two English-
men Arbuthnot and Ambrister. Alexander Arbuthnot was
taken in the Spanish Fort of St. Mark's, along with two
Indian chiefs, and Robert C. Ambrister, a few days after-
wards, on an excursion which the force made from that post
to destroy a neighboring Indian village. The two Indian
chiefs were hanged at once, and without trial; the justifica-
tion urged being that by their own usual practices in like cases,
and by the general manner in which they carried on war, the
United States had been considered as having put themselves
beyond the pale of the ordinary law of nations. Arbuthnot
and Ambrister were both, after a few days' confinement, tried
at St. Mark's by court martial; when Arbuthnot was sen-
tenced to death, the public justice of the United States was
further confused; but General Jackson annulled the latter
sentence, and Arbuthnot was hung and Ambrister shot.
There is no doubt that these persons were acting in concert
with the Indians; and, that being the case, it would perhaps
be difficult to show that they were entitled to other treat-
ment than those with whom they had associated themselves.
But even to take the lives of Indian prisoners of war was an
extreme proof of an abuse of very doubtful propriety; the
charge upon which the two Englishmen were tried was only
the very vague one of 'insulting the Indians to war;'
in these circumstances it was certainly startling evidence of
military action entirely general, under the most popular of
all governments, to set aside the sentence of a court martial,
as was done in the case of Ambrister. Besides, the principle
upon which General Jackson took his stand was even less tenable
than the one we have just stated; he himself vindicated what
he had done, on the ground that Arbuthnot and Ambrister,
by assisting in war against the United States while they were
at peace with Great Britain, became outlaws and pirates;
thus resting their liability to suffer death, when taken
prisoners of war, not on the ground of their having united
their fates with savages, but on that of their having been the
subjects of the same power to which they were enemies,
peace; a principle altogether unknown to the law of nations.
However, although a stout fight was made in Congress by the
opposite party, Jackson's friends, supported by the feeling out
of the movement of the people, he was enabled to force a democra-
tic professions bore down everything, carried a succession of
votes in his expulsion by large majorities.
General Jackson afterwards acted as commissioner on
the part of the United States in the negotiation with Spain for
the transference of Florida: and after the arrangement of the
treaty to that effect, he was, in 1821, appointed the first
Governor of the province. He held this post for a year, and
was then again elected a member of the Senate for the State of
Tennessee.
When the election of a new president came on at the end
of 1824, General Jackson was a candidate along with Mr.
Andrew Jackson was a candidate along with Mr.
Andrew Jackson. Mr. Clay's bronze medal for the first time
he had a large majority over the nearest of his competitors:
the numbers being Jackson 101, Adams 82, Crawford 41,
Clay 37. No candidate, however, having the majority re-
quainting the House of Representatives; and Adams and Clay
having united their strength, the former obtained the votes of
thirteen states against seven who voted for Jackson and four
who voted for Adams. Jackson, however, was triumphantly
elected in 1828, and again in 1832; so that he was at the head of the government of his native
country for the eight years from 1828 to 1837. His policy
depended for the most part upon the rapid growth of the
appearance of democratic tendencies of all kinds; and, at the same time, of both the spirit of territorial extension, with its near conse-
quences, conquest and war, and of the influence of the southern
states and the slave interest in the hands of the president, to
which the president personally came forward in the most
conspicuous manner was in the affairs of the United States
Bank. This bank, the renewal of its charter of which was
the ostensible motive for that intervention of the executive, was
in the hands of the general government; and hence the
renewal of its charter, though supported by both Houses of
Congress, was resisted, and successfully, both by the popular
voice and by the voice of the administration; the former by
offices, and who had been one of the most ardent and resolute
of the democratic leaders throughout his life.
General Jackson survived his presidency about eight years,
and died at his Chippewa house, near Nashville, Tennessee,
on Sunday the 8th of June, 1845. He was married,
but had no issue.

(Biographical Notice in New York Weekly Herald, of 21st of June, 1845; Funeral Oration delivered by Mr. Bancroft at Washington; Histories of the Time.)

JACQUARD, JOSEPH-MARIE, was born at Lyon, on
the 7th of July, 1764, of humble parents, both of whom were
employed in operations connected with weaving. He is said
to have been left to teach himself even to read and write; but
at a very early age he displayed a taste for mechanics, by con-
structing new models of buildings, furniture, &c. for amuse-
ment. At the age of twelve his father placed him with a
bookbinder for a time, and he was subsequently engaged in
type-founding and the manufacture of cutlery, in both of
which occupations he gave evidence of talent. Owing to the
death of his mother early and in extreme destitution, and
occupation of his father, who also died some years after,
leaving him a small property, which he employed in the
attempt to establish a business in the weaving of figured
fabrics. The undertaking failed, and he was compelled to sell
his looms in order to pay his debts. He subsequently
married, and hoped to receive a portion with his wife which
might assist him out of his pecuniary difficulties; but this
expectation proved delusive, and he was compelled to sell his
paternal residence. His wife, to whom he is said to have
been tenderly attached, is described as a model of patience,
kindness, and industry; while he appears, without fortune,
ambition, or foresight, to have occupied himself in various
schemes for improvements in weaving, cutlery, and type-
founding, which produced nothing for the support of his
family. Necessity at length compelled him to enter the ser-
vice of a linen-maker in Bresse, while his wife remained at
Lyon to attend to a small straw-hat business. In 1792 he
ardently embraced the revolutionary cause, and in the follow-
ishing year he returned to Lyon, and assisted in the memorable
defence of that place against the army of the Convention; his
son, then a youth of fifteen, fought by his side. Being
beneath the reduction of the Lyon, they were both com-
missioned to fly, and for a time they were supplanted.
His son was killed in battle, and upon this Jacuard returned
to Lyon, where he found his wife, whom he had been unable
to inform of his flight, bearing her bread by plaiting straw,
in which humble employment he was enabled to assist. Lyon at length began to rise from its ruins, and its
departures returned from Switzerland, Germany, and England,
where they had taken refuge. Under these circumstances,
Jacuard applied himself with renewed energy to the per-
fection of the beautiful apparatus for figured weaving which
bears his name, and which is described under Weaving, P. C.,
pp. 178, 179. He had conceived the idea of such an ap-
paratus as early as 1789, and he now succeeded, though
imperfectly, in accomplishing his end. His machine
was presented, in September, 1801, to the national exposition of
the products of industry, the jury of which awarded him a
medal. From this time he obtained a patent, or 'brevet d'invention,' for a term of ten years. He
set up a loom on his new principle at Lyon, which was visited
by Caram and several other of the statesmen who were as-
ssembled at that city in 1802 to arrange the affairs of the
Cispalpine republic.
About this time the attention of Jacuard appears to have
been directed, by the accidental discovery of an English
newspaper, to the fact that a reward was offered by a
society in this country for the invention of such an apparatus,
to the construction of a machine for weaving nets for fishing
and maritime purposes. From this time Dr. Bowring, who had conversed on the subject with Jacuard himself,
before a Select Committee of the House of Commons on
the silk trade, in 1822, and which is made the subject of

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an article in No. 50 of the 'Penny Magazine,' published in 1833, this would appear to have been Jacques' first mechanical invention by the more correct title given in its 'Supplément' to the 'Biographie Universelle,' to which we are chiefly indebted for the materials of this article, shows that such was not the case. He accomplished the desired object in a manner prescribed to himself and his friends with the utmost contrivance, he threw it aside. His machine-made net, how-
ever, fell into the hands of the prefect at Lyon, and the result was that, according to the arbitrary fashion of the time, he and his friends were placed under arrest and conveyed to the city of Paris, where the invention was submitted to inspectors, upon whose report a gold medal was awarded to him in February, 1804. On occasion of this forced visit to Paris, Jacques was introduced to Napoleon and Carnot, and on the latter's understanding his mechanism, roughly asked him if he were the man who pretended to do that impossibility—to tie a knot in a stretched string. Jacques, not disconcerted at such a reception, explained the action of his machinery with sim-
plicity, and convinced the incredulous minister that the sup-
posed impossibility was accomplished by it. He was then employed for a time in repairing and putting in order the models and machines in the Conservatoire des Arts et Métiers, and while there he produced some ingenious improvements in weaving machinery, one of which was for producing ribbons with a velvet face on each side. He also contrived some im-
provements for Jacquard's loom, which improvements are now used with a great success, the machine's mechanism is very complex, its application limited to very small patterns, its action slow, and its cost very great, it is con-

templated to belong rather to the class of curious than of useful machines.

In 1804 Jacques returned to Lyon, where he was long engaged in superintending the introduction of his inventions for figured weaving and for making nets, in which he was powerfully aided by Camille Pernot, a rich manufacturer. Through his assistance, a commission of manufacturers was appointed to report upon the first-named invention, and event-
ually an imperial decree, dated Berlin, October 27, 1806, was issued to authorize the municipal administration of Lyon to purchase his invention for the use of the public. In the same year the Academy of Sciences and Arts at that city pre-

tented him with the prize medal founded by the consul Lebrun. For some years Jacques had to struggle against much opposition and prejudice on the part of the Lyonese weavers, who conspired to discourage the use of his machinery, willfully spoiling their work to bring it to discredit, and through the Consul Prud'hommes, who were appointed to watch over the commercial interests of the city, had it pub-
licly broken up and sold as old materials. Even his personal safety was endangered. At one time, however, under the 

effect of foreign competition, the value of the invention was increased, and it was brought very extensively into use, not only in France, but in Switzerland, Germany, Italy, Austria, according to the 'Biographie Universelle,' it has been introduced even into China.

Jacquard was solicited by the manufacturers of Rouen and St. Quentin to organize their factories of cotton and batiste, and he received a tempting offer of a similar nature from Eng-
land; but he preferred remaining at Lyon, where he con-
tinued to exert himself in promoting the use of his great invention until, having lost his wife, he retired to Oullins, a village near Lyon, where he spent his latter years in retire-
ment, and died on the 7th of August, 1834, at the age of eighty-two. During his life he received the cross of the Legion of Honour, and in 1840 a public statue was raised to his memory. His 'Elége Historique' has been pub-
lished by M. de Fortis.

The name of Jacquard, \textquoteleft observe the writers of his memoir in the 'Biographie Universelle,' \textquoteleft has become, so to speak, technical, a sort of old and new word to denote a fabricator of the efforts of Jacquard, who, like him, was en-
gaged at Lyon in the improvement of weaving machinery. Jacquard has invented a simple and cheap machine, coming with the looms, and the handlooms were abandoned, which forms a memorable epoch—a new era—in the textile art.' By its agency the richest and most complex designs are produced with the city at the most moderate price; and, from so far diminishing expenditure on the importation of cloth, it has, according to the writers just quoted, in-

JAMESON, GEORGE, called by Walpole the 

Vandyck of Scotland, was the son of Andrew Jameson, an architect, and was born at Aberdeen in 1856. Jameson and Vandyck were about 1616 fellow-pupils of Rubens at Antwerp. When Charles I. visited Edinburgh in 1629, he sat to Jameson, and presented him with a diamond ring from his own finger. His career is not exactly known, but it must have been a successful one, for he left his wife and family well provided for at his death in 1644; and he is supposed to have changed his direc-
tions. He was probably in Italy, for his portrait is in the painter's portrait gallery at Florence; he travelled in com-
pany with Sir Colin Campbell of Glenorchy. Many of the con-
structions of Sir John and Jameson, who lived at Auchincruive, but the greatest collection is at Taymouth, the seat of the Earl of Breadalbane. Sir Colin Campbell, the earl's ancestor, was Jameson's first and chief patron. In a manuscript con-
taining the history of Sir Colin, there is mention of several portraits painted by Jameson for Sir Colin, with memoranda of the prices paid. For portraits of the king, Sir Robert Bruce, Charles I. and his queen, and for nine queens of Scotland, painted in 1615, Jameson received only 260 Scotch pounds, or 20 pounds per portrait, which is equal to 11. 18s. 4d. sterling; the Scotch pound was twenty pence. All other portraits painted for Sir Colin, which were not paid for at the time, are included in several of Jameson's pictures also in the two colleges of Aber-
deen. There is a portrait of Jameson by himself at Cullen House; he appears to have often painted his own portrait, and he always painted himself with his hat on, which he may have done either in imitation of Rubens, or on having been granted that privilege by Charles I. when he sat to him. Though the pupil of Rubens and the companion of Vandyck, Jameson's works have neither the fulness nor richness of the former, nor the vigour of the latter; they are however painted very thinly and with much nature, but there is a sharpness in his outline which reminds one of a very different school from that of Rubens. 'His excellence,' says Walpole, 'is said to consist in delicacy and softness, with a clear and beautiful coloring, his shades not charged but helped by varnish for the expression of places. . . . It is remarkable,' says Walpole, 'that anything which Jameson's countryman Cunningham in quoting this passage has added the following words to it as coming also from Walpole—"He had much of Vandyck's second manner; and Amosis and Angoby have of some of his works have been occasionally imitated.' These words are not in Walpole, at least not in the edition of 1782.

Jameson's earliest works are painted on panel; he used afterwards fine canvas, smoothly primed, and varnished in a shade tint. He painted occasionally history, miniature, and landscape. Walpole mentions a view of Edinburgh by him. Cunningham has ascribed to Jameson the illuminations of a manuscript of two hundred leaves of parchment, illustrating the Life of Christ, which belonged only to Jameson, and which he valued at 2000. Sterling. Jameson himself describes it as a manuscript in his possession containing two hundred leaves of parchment; brilliant, excellent writing adorns the borders of our Saviour curiously lined.' This memorandum was in the possession of his descendant, Mr. John Jameson, a wine-
merchant of Leith, from whom Walpole (or ra lar Vere) obtained a copy of the same manuscript. Jameson. It is not known what has become of this manuscript.

Cunningham speaks of Jameson as without a native rival in Great Britain; he appears to have overlooked Dobson, some of whose portraits are introduced to the present discussion. Jameson's daughter Mary excelled in embroidery, in textile paintings; some of her works are still preserved in the church of St. Nicolas, at Aberdeen.
JAMIESON, JOHN, D.D., is best known as the author of the Scottish Dictionary, but he published many other literary works. In 1817 he brought out his Life and Correspondence, which is still in demand and extremely valuable to students. His work, which was published in 1817, was well received and has since been reprinted several times.

Jamieson (so he himself spelt the name, though he made his children drop the i) was born in Glasgow, 3rd March, 1793. His grandfather was a man of some note in the theological world, and was a member of the two congregations of Secederists (that is, Presbyterian dissenters from the Established Church), which then comprised all the persons of their denomination in that city; this office he held for many years, struggling with ill health and an income of less than a hundred a year. The Seceder minister's family connections, however, were very good; and the course of his son's life was much influenced and coloured by that circumstance. Mr. Jamieson had been a Miss Cleland, whose mother was a daughter of the Rev. Robert Bruce of Garbot, son of a younger brother of Bruce of Kennet, in Clackmannanshire, a family allied to many of the high and influential families of the county. His grandfather, at the age of 84, was delivered of a son, the father of the line of Bruce with the ears of Elgin. These Bruses of Kennet had always been staunch Presbyterians; but it is remarkable that he has been a member of the Established Church, a remarkable instance of the change in the religious views of the Episcopalian. His son was so ashamed of this fact, that young Jamieson never could learn from him of what religion his grandfather had been, and it only occurred accidentally to his knowledge late in life. In those days especially the Seceders were distinguished even among other Presbyterians for their rigid and exclusive Presbyterianism.

The subject of the present notice remained throughout his life a steady, but by no means a narrow-minded Seceder. His mother's relations, taking him by the hand, early introduced him extensively into general society, and his literary tastes and associations further helped to liberalize him. Yet even after he numbered among his intimate acquaintances and friends many persons of great eminence and influence, and had become known in literature, his worldly circumstances continued extremely narrow. He was in fact kept back rather than brought forward by the governing bodies in his sect, in which, under a profoundly more popular constitution, the author of the clergy in their courts is, or at least was, nearly as much his master as that of the Conference among the Wesleyan Methodists.

The chronology of his life may be given in a few sentences. He was sent to the university of Glasgow when he was only nine years old. He was already conceiving at this time of the studies and life of a professor, and made preparations for the academy. In 1807, he entered upon the study of theology at the age of fourteen, under the Rev. William Moncrieff, who lectured on that subject to the young men intimated for the Seccesion ministry at Ailsa. After having been at Glasgow a year, however, he attended the lectures of Dugald Stewart on the disputation of 1763, attended lectures of the same nature. In July, 1779, having just completed his twentieth year, he was licensed as a preacher by the Seceder Presbytery of Glasgow. For some time he was employed, as the practice in his communion is or was, to do duty without any fixed engagement; first at Clonmel in Ayrshire, then in the Isle of Bute, then at Cowal in Argyllshire, and at various places in Perthshire and Fife. He was finally assigned to him the parish of Forfar, under the direction of the associate of the Royal Society of Literature from its institution till the general withdrawal of the allowances on the accession of William IV. In 1836 a pension to the same amount was assigned to him by the government, and he retained it till the 12th of July, 1838, leaving only one son, Mr. Farquhar Jamieson, a banker in Paris, of five that had reached the years of manhood. His second son, Mr. Robert Jamieson, had died a few years before, after rising to considerable distinction at the Scottish bar.

JAN MAYEN ISLAND is an island in the Arctic Polar
Sea, lying between 70° 49′ and 71° 5′ N. lat., and between 77° 15′ and 80° 45′ W. long. It extends from south-west to north-east about thirty miles, and is in no place above nine in breadth; at some places it is less than two miles. On the northern extremity, where the island is widest, stands the magnificent bay or harbour of Tain, a pleasant retreat, from 6670 to 6670 feet above the sea-level. It frequently shows its snow-capped summit above the clouds, and rests on a rocky mass 1800 feet high. In other parts the rocky masses appear to be a continuation of between 1800 and 2000 feet. A large portion of the island is composed of lava and other volcanic matter, and two craters have been discovered on the eastern side; smoke and fire have been observed in these places.

Even in the beginning of August all the high lands are found covered with snow and ice, and the low lands in those valleys and deep cavities where large beds of snow have been collected, retain part of their covering to the very border of the sea. At the foot of the Beerenberg are three very singular glaciers; they occupy recesses in the cliff where it is more than 1200 feet high, and nearly perpendicular. They are very rough on the surface, and of a greenish grey colour. They present the appearance of immense cataracts suddenly arrested in their progress and congealed by the power of an intense frost. Like cascades, their prominent greenish colour is variegated with snow-white patches, and is deepened by the jet-black points of the most prominent rocks peeping through their surfaces.

The coast has several roadsteads with good anchorage in five fathoms of water, black sand, but no harbour for a ship, all the anchorages being open to the sea in an angle of at least ten points of the compass. The soundings about the island are very irregular, and the bottom generally consists of rocks or black sand. The western navigation of the island is difficult, but the eastern comparatively safe. Jan Mayen is preferred to the eastern, as being less encumbered with ice and less subject to calms, squalls, and whirlwinds, which are often encountered in passing to the east of Bear Island. The coast is divided into three parts, viz. the spring of the year; but in autumn, and even in summer, the ice sometimes sets so far to the westward that it is not visible from any part of the land.

There are foxes and white bears, and perhaps also reindeer. Water-fowl are numerous, especially burgomasters, fulmars, puffins, guillemots, little auks, kyttywalks, and terns. Several cetacean animals abound, principally of the species Balma Physalis. The vegetation is very scanty, and limited to a few species scattered widely about among the volcanic minerals. Iron has been observed at several places.

The island was discovered in 1611 by a Dutch navigator called Jan Mayen, and was visited about 1680 by a sort of account of the great number of whales, which, however, afterwards retreated to other parts of the Arctic Sea. In this time (1680) the Dutch seamen wintered here, probably for the purpose of obtaining turtle, and they kept a regular journal. But on the arrival of the Dutch fleet in the following June all were found dead in their huts. From this journal it appeared that many had not been killed by the frost but by the scurry, which had attacked them for want of fresh provisions. Their journal terminated on the 31st of April.

JARDYN, KARLE DE, one of the best of the Dutch landscape, pastoral, and genre painters, and the most distinguished of N. Berghem's scholars. He was a native of Amsterdam, and lived some time in Rome, where the Flemish painters gave him the nickname of Bokkehoert (goat-beard). He died at Venice in 1678, aged about forty. There are many spirited etchings by his hand.

(Baillie, Groote Schooneberg, &c.; Bartch, Peinture-Gravure.)

JASIONE, a genus of plants belonging to the natural order Campanulaceae. It has a 3-leaved rotate calyx, auriculate, which forms a sort of flange at the base, a large green calyx, and 2 large white or lilac capitula opening by a large and somewhat valvular pore at the base. There is but one British species of this genus. J. mutabilis has a simple root, bluntish oblong wavy leaves, and a flower-stalk 6 inches high. The flowers are 1 inch long, pilose, simple, or branched: leafy below, bare and glabrous above, and ascend from the crown of the root. The flowers are small, in terminal bracteate heads, having a light blue color.

(Rabbin, Manual of British Botany.)

JAVOLYNUS PRISCUS, a Roman jurist, from whom there are a few excerpts in the Digest. His period is not quite certain, but he was born a few years after Caesar Augustus (31 B.C.) as a successor of Cæcilius Sabinius, and he accordingly belonged to the Sabini; and some writers place him in the time of Nerius and Hadrian. He was the master of Balbius Julianus. He may be considered as a Jurist of the second and third centuries. His chief work is a treatise, 'De aliquibus legibus,' concerning the Roman law, the title of which is placed on the title-page of the edition of which I have a copy. It is a very valuable work, and is often quoted by modern jurists.

(Jerome, Sir John, was born in Guernsey, August 18, 1795, and was the eldest son of the late John Jerome, a distinguished advocate of the Royal Court of that island. At an early age he was sent to the Universities and his acceptance, Tiverton, but his studies were soon interrupted by the premature death of his father. Upon his return to Guernsey he devoted himself to the study of law, which he completed during the winter of 1812. In his practice he rose rapidly, and before the commencement of his public life, he distinguished himself before the royal commissioners, sent over to Guernsey to correct certain abuses in the laws and administration of justice in that island. He was afterwards retained in many difficult cases, both civil and criminal, and soon acquired a high character for independence and energetic zeal in the discharge of his professional duties. On more than one occasion he was chosen by the people of Guernsey to represent them in the Privy Council, where his talents and eloquence found a larger sphere for their action, and brought him before the notice of government.

In October 1824, he was appointed to the office of Chief Justice of S. Louis, in the West Indies. 'At the time the tender of an appointment was made to him,' he observes, in his Essays on Colonial Slavery, 'he was unacquainted with a single individual in the service of the colonial department, and his political opinions were rather adverse to the then existing government. On the question of slavery he was thoroughly indifferent; indeed, it was so remote from his usual pursuits, that he may fairly say he had never given it a thought. In the intervals between the first proposal and the acceptance of his office, his professional avocations brought him to England, and on this occasion, probably owing to this proposal, his curiosity prompted him to make an annual sojourn. The impression made upon his mind was rather favorable to the views of the abolitionists. He heard much declamation, much angry and eloquent declamation; but accustomed from early life to sober and dispassionate thinking, he could not but have a deficiency of facts and of evidence on which to found his views. It was under this impression that he went to the colonies, and the candid expression of his feelings on the subject of slavery, which we have quoted, must acquit him of any bias in favor of its abolition, and proves that his subsequent devotion to the great cause of emancipation was the entire result of a conviction pressed upon him by an actual knowledge of the evils of the system. No sooner, indeed, was the slave law of 1831 promulgated, and the slave enjoyed the liberty of freely communicating with his protectors, than numerous examples of revolting cruelty, brought before him in his official capacity, introduced him to the idea of lasting change. He does not pretend to the extent of his inquiries was the depth of his conviction that the only remedy to the evil of slavery was the gradual emancipation of the slave. His views on this important subject were 'Fallacies and Canoons; or Slavery, as a Moral and Political Evil,' which he published on his return to Europe in 1831; in them he describes the general features of the slave communities, and the beneficial effect of the ameliorations already commenced. He recommended further measures, and the further measures required for the entire annihilation of the system. The principle by which he was actuated in publishing these essays will be seen from the following extract. 'Such them,' he says, 'is the unavowed motive which has actuated the West Indian communities; nor can they complain that they are anonymously maligned, that they are
guilted on rumor or insufficient evidence, or that sentiments are now expressed different from those which he was known to entertain when among them. Such sentiments, he held, urged them in the want of law and convenience; he had repeated them from the judgment-seat in the sternness of duty, with the still sterner proof before him. They are now published, neither vindictively nor in anger. Moreover, he has acquired the painful conviction that publicity alone can lead to a thorough reformation.

The year 1839, he was appointed to the office of Procurer and Advocate-General of the Mauritius. He had there to contend not only against objections of a personal nature, arising from known opinions on the slave question, but against national and deep-rooted antipathies of a population almost entirely of French origin, and strongly attached to French institutions. The office, moreover, which he held presented peculiar difficulties to one who was determined conscientiously to perform the duties it imposed. It was an error to assimilate it to that of an English attorney-general; they are only so far similar that they both fulfil the duties of a public prosecutor. The procurer-general, among the French, is an executive magistrate, and has to enforce the decrees of the courts, and he has under his control the police force of the country. When the disaffected party at the Mauritius heard of Mr. Jeremie's appointment to an office which, we believe, had a more effectual influence into the legal system than into the government, they broke out into an almost open rebellion. On his arrival before Port Louis, so great was the fear entertained for his personal safety by the British authorities, that all access to the house of residence was forbidden, and the assiduousness with which the governor had petitioned the governor altogether to prevent his landing; their request being refused, after a detention of two days he went on shore, under the protection of the whole naval and military force in the island, and on the same day was sworn into office, at a meeting of the legislative council.

The many scenes of violence which ensued are fully detailed in a pamphlet entitled 'Recent Events at the Mauritius,' which has published in vindication of having the authority of the court and the government. It will not be necessary to mention that the governor thought it advisable, for the security of the public peace, to order him to return to England, he having previously declined to do so, except with a written command, which was given him to that effect. On his arrival in London he immediately reported himself to the colonial office, adding, that he was ready to resume his journey back to the Mauritius at an hour's notice. His request, though delayed, was granted, and his return to that island preceded by an additional military force. The feelings, however, originally excited against him did not easily subside, and his residence there, which terminated in 1836, was embittered by a series of painful events arising from the fever advocacy of his opinions. Within three years, to use his own words, he had traversed fifty thousand miles, encountered the assassin on the shore and the penknife in the reading-room, in the service of the crown every peril to which life is subject, whether from the ocean, from climate, or from the hand of man.

In the year 1836, he was appointed to the office of judge of the Supreme Court of Ceylon, and during the same year he received a gratifying proof that his devoted zeal in behalf of emancipation had been fully estimated by the British public. A valuable piece of plate was presented to him by the Anti-Slavery Society; the inscription upon it testifying that 'by his disinterested, able, and energetic exertions in most critical and painful situations, both at home and abroad, negro freedom had been largely advanced, and the negro character raised to its just standard in public estimation.'

His residence during four years at Ceylon was the only tranquil period of his eventful life. Early in the year 1840, he stated in his pamphlet 'Civilization,' addressed to Sir J. F. Burton, 'It is the description and shows, what he considers will be the future effects of emancipation in the colonies, and gives a short outline of the progress of the sciences, and advance the civilization of Western Africa. He looks upon the emigration of the emancipated negro of the West Indies to the land of his origin as one of the most likely means of advancement.'

He says, 'we must look for the regeneration of Africa. To a reflex of the west upon the east, in moderate numbers, and managed with caution, must we look for the civilization of the east.'

It was to carry into effect the measures which had been suggested for ameliorating the condition of the liberated slaves that, undeterred by the perils of a pestilential climate, he accepted, in October, 1840, the important office of Governor and Commander-in-Chief of Sierra Leone, a colony of great value, and on the same day received the honour of knighthood. On the 23rd of April, 1841, only four months after his arrival and the Sierra Leone, a colony of great value, and on the same day received the honour of knighthood. On the 23rd of April, 1841, only four months after his arrival and the

To his earnest request, accompanied his father as private secretary, which appointment he held under the succeeding Governor until 1843, when he likewise fell a victim to the climate. Of Sir J. Jeremie's character, very few can form a just opinion, as the singular services of his widow, the constant sharer of his perils, alone survives. The inhabitants of St. Lucia, when the news of his death reached them, marked their regret for his loss by a general mourning. But perhaps the most gratifying tribute to his memory is to be found in an address made on that occasion to the Royal Court of St. Lucia by his friend Dr. Reddie, who had succeeded him as chief justice of that colony. The following passages are contained in it:—'To say that Sir J. Jeremie was the ablest judge, was the most useful judge, who ever presided at St. Lucia, is saying little indeed. For the laws which he enforced, and the reforms which he introduced into the legal system by a series of measures of importance and by a recovery of the works of the court and the government, which was given him to that effect. On his arrival in London he immediately reported himself to the colonial office, adding, that he was ready to resume his journey back to the Mauritius at an hour's notice. His request, though delayed, was granted, and his return to that island preceded by an additional military force. The feelings, however, originally excited against him did not easily subside, and his residence there, which terminated in 1836, was embittered by a series of painful events arising from the fever advocacy of his opinions. Within three years, to use his own words, he had traversed fifty thousand miles, encountered the assassin on the shore and the penknife in the reading-room, in the service of the crown every peril to which life is subject, whether from the ocean, from climate, or from the hand of man.

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altar-piece of the church of Bostraente, and was buried in that town, but his body was removed to Valencia and deposited in the church of Santa Cruz in 1581.

Joanes was one of the best of the Spanish painters; he is acknowledged head of the school of Valencia, and sometimes termed the Spanish Raphael. His drawing is correct, and displays many successful examples of foreshortening; his drapery is well cast, his colouring is sombre (he was particularly fond of mulberry colour), and his expression is mostly in perfect accordance with his subject, which is generally devotion or impassioned resignition, as in the Baptism of Christ in the cathedral of Valencia. Joanes' subjects are exclusively religious and if, as Cean Bermudez, Manuel de Arce, and on this account deserved the title of El Divino, Joanes is equally entitled to it. Like his countryman Vargas and D`Amato of Naples, he is said to have always taken the sacred before he commenced an altar-piece. His best works are in the cathedral of Valencia, and there are several good specimens in the Prado at Madrid. To mention a minor quality of his works, he excelled in painting hair.

Joanes had many scholars, among whom his son Juan Vicente was not distinguished: his daughters also, Dorotea and Margarita, were well known for their ability in painting. (Cean Bermudez, Diccionario Histórico, &c.)

EHL, the name of two celebrated engravers of Antwerp, father and son.

The elder, the son of Gerardo de Jode, likewise an engraver, was born in 1570. He was the pupil of Goltzius, studied in Italy and at Paris, and died at Antwerp in 1634.

De Jode engraved many plates in a good style, among them the remarkable picture The Last Judgment, by Correggio, which belonged to Charles I., Mercury instructing Cupid, which is now in the National Gallery. Scarcely anything is known of him personally: as an engraver he was inferior to his father and grandfather.

(Cabinet-Monument des Gravures; Hubert, Manuel des Amateurs, &c.)

JOHN, KING OF SWEDEN. [Charles XIV.]

JOHNSTON, DR. ARTHUR, the fifth son of an ancient family possessing estates in Aberdeenshire, was born in that county in 1587. At an early age he went abroad for medical education, and the degree of Doctor in Medicina was conferred on him at Padua in 1610. He travelled in various parts of the continent, and resided for twenty years in France, marrying twice in the course of that period. He returned to his native country before the year 1636, and was soon afterwards appointed physician to King Charles I., probably through the influence of Laud. After this appointment he must have resided chiefly in the neighbourhood of the court. In 1641 he died at Oxford, while on a visit to a daughter married there. Johnston's name is preserved in the memory of scholars by his Latin verses. He was the most extensive contributor, and is not usually called the editor, of Sir John Scott's collection of Latin poems, the Deltitiae Poetarum Scotiae (hujus Eur̦ Illustrium, Amsterdam, 1677, 2 vols. 12mo.; and besides several other volumes of compositions in Latin verse, he was bold enough to measure lances with Bevanan in a version of the Psalms, in Paradisi Poetica Scotiae, Amsterdam, 1637, 8vo. This ambitious attempt led, many years afterwards, to a protracted controversy on the merits of the rival versions; but the dispute is related, and Johnston's works fully described in Dr. Irving's Lives of Scottish Writers, 1859, 2 vols. 8vo.

It is enough here to say, that Johnston's high rank among modern writers of Latin poetry is universally admitted; and that, although in Scotland his psalms have usually been estimated much below Buchanan's, the justice of this sentence has been questioned by critics of authority, of whom Mr. Hallam is one (Introduction to Johnson's Works, and An Account of the Society, 1832). This is due to the fact that these few pieces of wood together for the interior fittings of buildings, for making articles of furniture, and for numerous purposes requiring greater neatness of workmanship than the operations of the carpenter. [Carpenter, P. C. S., p. 309.] The carpentry and joinery are in many instances combined in the same establishment, and even by the same workmen, it would be difficult accurately to define the limits of these two kindred arts at a good general definition is drawn between them in Tredgold's article 'Joinery,' in the seventh edition of the 'Encyclopaedia Britannica,' where it is stated that the art of carpentry is directed almost wholly to the support of weight or pressure, owing to which circumstance its leading principles belong to the mechanical sciences. The proper object of carpenter's work in a building is to give firmness and stability to the structure; and within its proper range may be embraced all the rough timber-work necessary for the support, division, or connection of the several parts of a building. Carpentry thus includes the construction of the framing of doors, partitions, and roofs. Joinery, according to the same authority, has for its object the fixed work-work necessary for convenience or ornament; and while it does not call for the application of much mechanical science, it requires, as Tredgold observes, much skill in the tools that depend upon the geometrical and trigonometrical projection and description of lines, surfaces, and solids, as well as an intimate knowledge of the structure and properties of wood. The principal items of joiner's work in a building, as enumerated by this author, are doors, windows, roofs, and the 'Encyclopaedia Metropolitana,' are the doors, windows, margins round plasters to protect it from injury at angles, &c.; decorations generally, such as architraves, base, columns, and pilasters; doors, thresholds, &c.; and in the projection of staircases, &c. decorations generally, such as architraves, base, columns, and pilasters; doors, thresholds, &c.; and in the projection of staircases, &c.

The construction of staircases [Staircase, P. C., p. 428], are considered as falling into the department of the joiner rather than that of the cabinet-maker, and the hand-railing of staircases is a department of joinery which requires much ingenuity, and is treated at great length in many works on the subject. Tredgold observes that cabinet-making, or that department of wood-work which relates to the making of furniture, has little affinity with joinery, although the same materials and tools are employed in both descriptions of work. The line of demarcation, however, between joinery and cabinet-making would seem to be even more difficult to define than that between carpentry and joinery; and, with the exception of such matters as veneering and polishing, which relate only to the use of the harder and more valuable woods, the operations of the cabinet-maker and the joiner are nearly identical, the same means being adopted by both for the production of neat and strong joints, and for erasing the injurious effect of shrinkage, warping, and the geometrical direction of the material. Indeed, Tredgold, indeed, remarked by the author of 'The Joiner and Cabinet-Maker,' in Knight's series of Industrial Guide-Books, that 'the same man will call himself a joiner when he is working in deal, or oak, or ash, and making a strong kitchen table, or a door, or a corn- chest, and a cabinet-maker when he is working in mahogany or rose-wood, and making a dressing-desk or a cabinet.'

Tredgold, in the article above referred to, has collected numerous notices relative to the progressive improvement of the art of joinery, and the principal works which have been published on the subject. He traces the origin of the art in the thrones, stools, pulpits, and screens of cathedrals and churches, in which, however, the joinery is of the most simple kind, and is indebted to the cutter for its ornament. The earliest writer on joinery to whom he alludes is John Mowbray, in whose 'Mechanick Experiments, 1677, the tools and ordinary operations of the joiner, and the technical terms then in use, are explained. He attributes the credit of establishing the principles of joinery, in this country, or in Scotland, to Peter Nicholson, whose valuable practical works of the late Peter Nicholson, who appears to have been the first English writer on the subject who derived assistance from the works of continental writers, who have previously produced valuable works on joinery, which show that some things given as new by English writers have long been known on the continent; but Tredgold observes that in
practice the French joiners are very inferior to our own. 'Their work,' he says, 'is rough, slovenly, and often clumsy, and has an air that betrays nearly as much nervousness, soundness, and accuracy which is so common to every part of the works of an English joiner, is scarcely to be found in the works of a French one.' 'The little correspondence,' he adds, 'that has hitherto passed between the two countries, leads us to think that their theoretical knowledge is inferior to that of the French, and that they are really much behind in their art.'

In this respect, the French are much behind in their art. The French joinery is not so well executed as that of the English, and the French carpenters are not so skilled in their work as the English. The French joiners are not so attentive to detail and are not so careful in their work.

This subject is briefly noticed under Carpentry, P. C. S., p. 229, and some information bearing upon it is given in Entomo, P. C. S., p. 120, an explanation, illustrated by sectional diagrams, of the manner in which wooly matter is formed, and of the arrangement of the component parts of the trunk of a tree.

Redgold gives much information relative to various kinds of wood in his 'Elementary Principles of Carpentry,' and, in his treatise on joinery in the 'Encyclopedia Britannica,' he gives the results of some important experiments on those peculiar properties of wood which lead to its warping and cracking. Of these the first in order was made by J. A. Knight, Esq., and published by him in 1801 and 1817; and they appear to be opposed to some general observations made on the subject in the same year. This subject is very important, as it has been the subject of much attention in the last century, and is one of the principal causes of the decay of old buildings.

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as possible from knots, and sawing them longitudinally into pieces four inches or four inches and a half wide. These are glued together side by side, an edge which has been nearest the heart of the tree being joined to an outside edge. When the glue is thoroughly set, the wide compound board thus produced is again cut up into slips, by sawing it longitudinally midway between the joints, and these slips are rejoined, with a further change in the order of placing the pieces. The grain of the joints is thus not more than two inches wide, so arranged as mutually to counteract any inclination to warping. A due regard to the laws of warping and shrinkage is also very necessary in the construction of large pieces which are to be built up, as, of several distinct pieces of wood. In making wooden columns, for example, several pieces must be fitted together to form a hollow cylinder, in preference to using one large post; or, where large posts are used, they must, if appearance is to be regarded, be surrounded by a number of narrow pieces. Small columns may be made of a single piece, and prevented from splitting by boring a large hole down their axis.

The original shrinkage of wood in drying is not however the only change of dimension to be provided for, since, from its hygroscopic properties, changes in the state of the atmosphere occasion even old and seasoned wood to vary in size from time to time. Of this we have a familiar illustration in the fact that doors, especially garden doors, which open and shut with facility in dry weather, frequently swell so as to become unopenable in a humid state of the atmosphere. From experiments made by M. Roudetel, quoted by Tredgold, it appears that in wood of a mean degree of dryness the extent of contraction and expansion produced by the usual changes in the state of the atmosphere was, in fir-wood, from 1/4th to 1/4th part of its width, and in oak, from 1/4th to 1/4th part of its width, showing a mean variation equal to 1/4th part of the width in fir, and 1/4th part of the width in oak. At this mean rate of variation the difference of width produced by the above cause alone in a fir board about 12 inches wide would be 1/4th of an inch, an amount abundantly sufficient to cause the board to split or crack, if it were fixed immovably at both edges.

For the above reasons it is always necessary to insert pannels in the framework in which they are mounted, in such a manner as to allow free motion at one or both edges. An ordinary framed door, such as that represented under Door, P. C., p. 86, affords a good example of panelled work, and one in which this peculiarity may be readily observed. In this kind of door the stiles, marked 2, 2, in the cut referred to, the rails, marked 5, 6, and the muntins (or, as they are frequently called by workmen, the muntins), marked 6, 6, 6, constitute a strong framing of thick but comparatively narrow pieces of wood, the rectangular openings of which, marked 1, 1, 1, 1, and 3, 3, 3, 3, are filled with pannels. These pannels are made to fit with sufficient accuracy to prevent shaking or rattling, yet not so tight as to prevent their sliding a little in the grooves, as the pannels shrink or expand. The usual practice is to fit them just so tight that a little force applied to the edge of the pannel with the palm of the hand, is sufficient to drive it into its place. In new houses it may often be perceived, by the appearance of the paint towards the sides, or rather edges, of the panels of doors and window-sash-frames, that, even when not more than nine or ten inches wide, they have shrunk at least one-eighth of an inch since the completion of the painting; nothing was taken to account them previously, and if observations were made with sufficient accuracy, it would be found that the amount of shrinkage appears to be greater or less according to the state of the atmosphere. The addition then to the glue or solar heat, and the difference of outside and inside of pieces occasioned the pannels to crack or split, which they occasionally do with a noise sufficiently indicative of the irresistible force with which the change of dimension takes place. In superior doors the gluing is thoroughly set, the wide compound board thus produced is again cut up into slips, by sawing it longitudinally midway between the joints, and these slips are rejoined, with a further change in the order of placing the pieces. The grain of the joints is thus not more than two inches wide, so arranged as mutually to counteract any inclination to warping. A due regard to the laws of warping and shrinkage is also very necessary in the construction of large pieces which are to be built up, as, of several distinct pieces of wood. In making wooden columns, for example, several pieces must be fitted together to form a hollow cylinder, in preference to using one large post; or, where large posts are used, they must, if appearance is to be regarded, be surrounded by a number of narrow pieces. Small columns may be made of a single piece, and prevented from splitting by boring a large hole down their axis.

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The appearance of such boarding may be improved by forming a head with a moulding-plane along one edge of each board on the visible side, as at b, b, Fig. 2, because by that means the open joint is in some degree masked by the quirk or wide groove on the opposite side of the boarding. The same means of avoiding the disagreeable appearance of the opening joint is adopted in some doors and shutters which are framed and panelled in the usual manner, but in which the pannels are made two-thirds instead of one-third of the thickness of the framing, the muntins being suitably cut to correspond with the thickness of an ordinary pannel, and the relaoted portion alone is inserted in the grooves of the framing, while the uncovered portion of the pannel is brought flush or even with the surface of the framing. This mode of construction is often adopted for external doors, as it allows them to be made strong without any great thickness of framing. At c, c, Fig. 2, is shown another mode of joining boards side by side, which is called match-boarding, and is applicable to timber or stuff of or exceeding half an inch in thickness. This plan is frequently adopted for the kind of inferior doors called ledged doors, which, to avoid the expense of framing, are made of narrow boards placed side by side, and held together by transverse pieces called ledges or battens, to which each of the boards is nailed. The joint, as shown in the cut, where it is represented taken away a head, consists of a groove cut in the edge of one board, receiving a projecting tongue formed on the edge of the adjoining one. Planes called match-planes, made in pairs, one for forming the groove and the other for forming the tongue are made to facilitate the fitting of match-boarding; but when the joiner does not possess these the groove may be formed with the kind of grooving-plane called a plough, and the tongue by cutting away each side with a rebate-plane, which is more commonly, though incorrectly, termed a rabbit-plane. Similar to this kind of joint is that called ploughing and tongueing, in which both edges of every board are grooved, and a separate strip of wood is inserted between them to fill the spaces. This plan, which involves no waste of material, is often employed in floors.

As indicated by its name, a very important department of the art of joinery is the formation of strong and accurate
The joints hitherto noticed are not intended so much for holding together the pieces of wood united by them, that object being effected by the screws or other fastenings. In the case of a framed door or piece of panelling, and by the ledges and cross-pieces in the case of a ledged door, as at 3, for example, in the case of changes of dimension; but we have yet to notice such as are intended for the several parts of a framing or other construction. On this branch of the art Tredgold well observes that while in carpentry framers owe their strength principally to the form and position of several members, the union of the timbers in works of joinery depends wholly upon the joints.

The simplest mode of uniting two pieces of wood is to cut the end of one piece and fit each other, separately, and to cement them together with glue. [Gane, P. C., p. 278.]

When the glue is good and properly applied a glued joint is surprisingly strong—stronger indeed, in some cases, than the wood itself; if, for example, two boards be glued edge to edge, as for forming a panel, the wood will break, if sufficient force be applied, without the joint giving way. In forming such a joint the adjoining edges must be planed perfectly straight and smooth, which may be readily done by the use of the flat contrivance called a "shooting-board," which is a flat board with a perfectly straight edge, and with a cross-piece fitted on near one end at right angles with that edge. This board being laid on the bench, the laid of the glue is daubed upon it, with its end against the cross-piece or stop, and the plane, which is laid on its side on the bench, is rapidly slid or shot along, being guided by the edge of the shooting-board, and forcing a space for the glue to pass, the glue thus made true, is smeared with hot glue, and one is rubbed backwards and forwards a few times over the other, to distribute the fluid glue equally, to force it into the pores of the wood, and to exclude any air which might be present, and to make the joint close. This done, the boards should be set aside until the glue is perfectly set. To prevent the possibility of any strain which might tend to open the joint while the glue is soft, it is well In some cases to fix the edges together with wooden wedges, so that the weight of the uppermost piece may tend to keep the joint close.

In many other kinds of joint the hold of glue is less perfect in consequence of the impossibility of applying the rubbing-down necessary for the purpose above mentioned; and in such cases it is necessary to secure the parts united by it in their places by screwing the articles up in an iron cramp, by weighting, or by wedging. From a carefully conducted experiment by Mr. E. Bevan, of which, as well as of his experiments on nails, which are referred to below, an account is given in the article "Adhesion" in Herbart's "Engineer's and Mechanic's Encyclopedia," apparently on the authority of the 'Mechanics' Magazine,' it appears that the adhesion of glue, under favourable circumstances, is equal to a force of at least 715 lbs. per square inch. In the experiment referred to a force of 1,200 lbs., applied gradually, was necessary to separate two cylinders of dry ash-wood, the ends of which presented a surface equal to 176 square inch, and which were glued and placed in a vertical position, in order to get a clean surface of the joint.

Even this weight was sustained for two or three minutes before the joint gave way; and it was found, on examining the separated surfaces, that the glue was very thin, and had not entirely covered the surface. The cohesive strength of the glue appears therefore in this experiment to have been rather more that 715 lbs. per square inch, while the cohesive strength of the wood thus united, in a lateral direction, was found to be only 569 lbs., thus showing that, if the joint had been between the sides instead of the ends of the pieces of wood, the wood would have given way before the glue. In this case, however, the glue was newly made, and the test was performed in the height of the winter season, with glue which had been frequently made, with occasional additions of glue and water, the cohesive force indicated was only from 320 lbs. to 500 lbs. per square inch. When the glue is made in winter, and has been kept in store made in the winter season, with glue which had been frequently made, with occasional additions of glue and water, the cohesive force indicated was only from 320 lbs. to 500 lbs. per square inch, from which it may be inferred that its application as a cement is capable of such improvement as to show a more adhesive property. In this respect the adhesive is much superior to that of gums.

Glue that has been made a long time and kept in store is found to possess greater tenacity than newly-made glue; and for the use of the joint a pale-coloured glue is preferred, by using the same glue in making the joint a little more adhesive and warping. The appearance of such a joint may be in some measure improved by the introduction of a small bead on the shutting piece, as at b, Fig. 3, or, by converting the whole of the joint into a little bead, as at c, Fig. 5, a plan which is often adopted, with very good effect, in the interior fittings of a house. The kind of joint marked A, of which a detailed description is given, is nearer than the simple joint a, as the end of the glue is nowhere exposed to view, and it allows nailing in both directions; but it is not so secure, and, owing to the
tendency of the inclined faces to slip upon each other, it is difficult to form it with accuracy. It is the joint used for the angles of picture-frames, and for many other purposes in which the joint is exposed to view in the same manner; and in such cases the strength of the joint is often increased by inserting, in a saw-cut made for the purpose in a sloping direction, a thin slip or key of hard wood in the direction indicated by the dotted lines. This key is inserted with glue, and when that is dry, the superficial corners are cut off. At e, Fig. 3, is shown a mitred joint at an obtuse angle, to show that this form of joint is applicable to any angle, the planes of the joint being in all cases made to bisect the angle. To facilitate the accurate formation of mitred joints, joiners employ a contrivance called a mitre-box, by which they are enabled to saw and planes, or chisel, the inclined faces exactly to the required angle. The last joint represented in Fig. 3, that marked f, is a combination of the overlapping with the mitred joint, much nearer, where the angle alone is visible, than the former, and stronger in the latter, like wood, may be nailed both ways. Fig. 4 illustrates an arrangement almost too simple to need explanation, by which the strength of a mitred joint of the over-lap kind may, with less trouble, result in a great increase. Simple as it is, however, it is very rarely practiced in this country, and, indeed, has never been seen by the writer excepting in tobacco-chests or packing-cases from America. For nearer purposes it might be worth while to divide each joint into four or more portions, instead of two only, as in the cut, but which means the tendency of the joint to open by the warping of the wood, or in consequence of external violence, would be still further resisted, owing to the more frequent changes in the direction of the nails.

In all the angular joints above noticed, the two pieces of wood which form the members of the joint are held together by the glue, nails, or screws applied to connect them; but in the higher operations of the joiner and cabinet maker, the wood is so cut as in some degree to hold the construction together independently of such aid. In the joints shown in Fig. 5, for example, where a represents a joint adapted for external angles, and b a joint for internal angles, such as those of the skirtings of a room, the form of the joint alone would hold it together, irrespective of any fastenings. The same rate of the parts, aided by the glue, and in some cases by nails or screws, renders the joint so strong even in that direction that, if properly made, the wood will sooner break than separate at the joint. The small dovetail-shaped projections in the piece a are called pins, and the openings cut in the end of b to receive them, holes. When the boards which constitute the members of a long dovetailed joint are composed of two or more pieces glued together at the edges, it is well so to arrange the dovetailing that the glued joint, if in the piece corresponding with in the cut, shall fall in one of the pins, and not in a groove between them, and if in the piece in one of the intervening solid spaces between the holes, and not in the hole itself; because by such an arrangement the driving up of the dovetail tends to hold the glued joint together, while it might otherwise tend to split it open. In connecting the front of a drawer with its sides, it is desirable to conceal the joint entirely on the front face. This is done by the kind of joint shown in Fig. 7, which is termed a dovetail blind of one eye.

In it the piece forming the front of the drawer is made thicker than the side, and the pins, which are formed on the front piece, are made only as large as if were of the same thickness as the side, and the intervening spaces are not cut through the extra thickness of the wood. Similar to this is the dovetail blind of both eyes, or mitred dovetail, in which both pieces are of equal thickness, and the pin-holes, as well as the pins, are stopped about one-eighth or three-sixteenths of an inch from the outer or visible surface of the wood, the extra thickness of the wood thus left uncut being mitred; so that the joint is invisible on both sides, but the means by which it is rendered so is completely invisible. Such a joint of course requires very accurate workmanship, to enable all the parts to fit closely without being so tight in any part as to need injurious force in knocking it into its proper position.

The only other kind of joint that claims notice here is the mortise and tenon, which is the kind of joint usually employed for connecting the several members of the framing of a door or similar piece of panelled work, as well as for many other purposes. A mortise is a deep and narrow groove cut in one member of the framing to receive a corresponding projection called a tenon, or, improperly, a tenon, formed on the end of another member of the framing which abuts upon it, usually at right angles. Tredgold recommends that the thickness of a tenon, and consequently the width of the mortise to receive it, should be about one-fourth of the thickness of the framing, and that the width of the tenon should never be greater than five times its thickness. A more general rule, however, is to make the tenon one-third the thickness of that part of the framing which it is to enter. When the members of the framing are wide, the tenon is divided by an intervening space into two parts, by which the necessity for weakening the frame by very long mortises is avoided. In Fig. 8, a represents a divided tenon of this kind, and b what is termed a double tenon, which is sometimes used in very thick framing, especially in the framing of doors which are to receive mortise locks, or locks inserted in the thickness of the door, in which case the neck is placed in the interval between the two tenons. In some cases, where a single tenon is used in thick framing, a small projection called a cross or feather-tenon is formed on each side of it like a very short tenon, as in c, Fig. 8 shallow grooves or mortises being cut on each side of the principal mortise to receive them.
Clamping is an expedient resorted to by the joiner when he wishes to secure a broad board, whether formed of a single piece, or of two or more glued together at their edges (in such case, if the wood be thick, dorels, or pins inserted halfway into each of the adjoining pieces, may be used to aid the glue), from liability to warping. It consists in fitting on to each end a transverse piece, as at d, Fig. 8, the grain of which runs at right angles with that of the board. The connection between the board and the clamps is effected by a tongue formed on the end of the board, visible at the edge in the cut, and entering a groove ploughed in the edge of the clamp. In addition to this tongue, which extends across the whole width of the board, two or three tenons, which may or may not pass completely through to the external edge of the clamp, are frequently formed on the end of the board, in which case the joint is termed a mortise clamp; and in some cases where special neatness is required the ends of the clamps are mitered into the board, as at e, Fig. 8, which is called a mitre clamp, and in which both the tongue and the tenons, if any, are used, may be made invisible. Where it is necessary to curve boards by softening them, by boiling or steaming, and forcing them into the required shape (in which they are retained by gluing blocks underneath them and by other means upon a saddle or mould), Tredgold observes that the process may be improved by saturating the convex side, while the wood is still confined to the mould, with strong glue, which may dry and harden in the extended pores, and thereby tend to keep the wood in the required shape when it is removed from the mould.

The plan of this article does not admit of more than a passing reference to the large subject of geometry as applied to the joiner's art; a subject which is treated at length in the practical treatises of Nicholson and Tredgold; nor does it allow of any detailed explanation of the modes of executing the various departments of his work, which, together with a full account of the tools employed, may be found in Nicholson's 'Architectural Dictionary.' The tract entitled 'The Joiner and Cabinet-maker,' alluded to near the commencement of this article, will be found an admirable preparative for more extensive works: explaining, as it does by a few familiar examples, in terms easy to be understood, most of the ordinary operations of the joiner, and some of those of the cabinet-maker. Of some of the principal tools used in joinery accounts are given under Saw, P. C., p. 476; Boring Instruments, P. C. S., p. 225; and Bevel, P. C. S., p. 192. Of the other tools commonly employed, planes, of which a great number adapted for different uses are required, are the most important. An ordinary plane may be described as a broad and very sharp chisel mounted in a large block of wood in such a manner that it is always kept at a certain angle (varying according to the purpose to which it is to be applied, but commonly about 45°) with the face of the stock, which, by sliding along the board to which the plane is applied, keeps the blade always in the right position for cutting, and prevents it from digging too deep into the wood. The weight and size of the stock also enable the workman to apply the tool with greater effect and steadiness than he could a chisel held in the hand. The degree of projection of the blade from the face of the plane is capable of regulation, and the blade is held in its required position, by a wedge, which may be inserted and the blade caused to rise a little into the stock in case it should become too prominent, or technically, too proud, by striking the stock or other end of it against a hammer, or by striking it like manner on the upper surface of the front end of the stock. In planing a board to a smooth surface the workman commonly uses three planes: first, a course one, which takes off thick shavings, called a jack-plane; then one adapted for taking very thin shavings and having a very long stock, called a try-square plane. The author of the 'Joiner and Cabinet-maker' thinks that this name means true- ing plane: the object of the instrument being to make the surface perfectly flat or even; but the ordinary use is still more applicable, since the workman in using this plane is continually trying where, by any undue prominence in the wood, he can take off a shaving; the length and straightness of the stock, with the angle of the blade which he frequently tests his work with a straight-edge, prevent the plane from biting or cutting where the board is hollow. So soon as the workman finds that he can take a continuous shaving off the whole length of the board with the try-plane he knows that the surface is rendered sufficiently flat. The third plane used for ordinary work is a small short-stocked plane, called a smoothing plane, adapted for application in various directions to parts in which the grain may run irregularly, and for planing up small parts of the work for which the other planes are unsuitable owing to their large size. For such operations as rebateing, grooving, or ploughing, and cutting beads and mouldings, other kinds of planes are used, in which both the cutting edges of the blades and the faces of the stocks are so formed as to be exact counterparts of the shape of the rebate, groove, bead or moulding required. In many planes of this character, which have an immense variety of work, besides requiring the joiner to perform work which even a skilful carpenter could not do so well by hand in ten times the time required with the use of the plane, the blade or iron is so fixed as to cross the face of the stock obliquely, that it may the better clear itself of shavings. In planing a piece of deal or any similar soft wood, it is necessary to avoid meeting the grain, which would cause the plane to stick fast; and when this inconvenience is felt it may almost always be avoided by turning the wood, and planing in the opposite direction. In planing mahogany or some other hard woods, it is more difficult to avoid meeting the grain, as it is often be found running one way in one part of the board and another way in another. To remedy this inconvenience, observes the author of 'The Joiner and Cabinet-maker,' 'the cabinet-makers' planes are made of a double iron: that is, an iron with a flat dull edge is screwed on the face of the cutting-iron so as to prevent the shavings chipping up against the grain.' The more cross-grained the wood is, he adds, 'the closer does the cabinet-maker bring down the dull iron towards the edge of the sharp one, and the finer are his shavings in consequence. The joiner's trying-plane and smoothing-plane, if not his jack also, are likewise turned with the grain, and, besides being used for cross- and grain-wound woods; but when he is planing straight-grained deal, he keeps the dull iron at a good distance, perhaps an eighth of an inch, from the cutting edge, so that the shaving comes off without touching it. To fit the blades of these plane are made of a steeper or more upright pitch than those of the joiner; and among the planes peculiar to his business is the tooling-plane, which has a nearly vertical blade with a notchted or scarred edge, produced by burnes on the face of the iron. It is used principally for roughening the surfaces of veneers and of the wood upon which they are laid, to give a better hold to the glue.

Of turning, which, though a totally distinct occupation is an essential adjunct to the art of cabinet-making, an account is given under Turning, P. C., p. 418; and veneering, which is an important branch of the cabinet-maker's business, is briefly noticed under Veneering, P. C., p. 206. The last-mentioned process, as applied to the large surface of the top of a chest of drawers, is minutely described in the 'Joiner and Cabinet-maker,' in which work, as well as in the fourth volume of Dodd's British Malting, the author of this work, having noticed the previous column, details are also given respecting polishing with linseed oil (called furniture oil, when coloured dark to match the mahogany, to which it imparts a darker hue); beeswax and turpentine, especially French, but often pitch is used instead of wax. A little paraffin oil is usually made of gum-shells, gum-seedleaves, and Venice turpentine, mixed in various proportions and dissolved in spirits of wine; but as these mattes do not adhere well to the art of joinery, an incidental reference in this place is sufficient.

JONES, JOHN, Ll.D., was born in the parish of Llandinam, in Caermarthenshire, where his father was a farmer. He was educated at a grammar-school at Brecon, and afterwards became a student at the Univerity New Col...
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by Hackney, where he was a famous pupil of Gilbert Wakefield.

In 1792 Mr. Jones was appointed classical and mathematical teacher in the Welsh Academy, Swansea, which situation he held about three years, and then settled at Fympor, near the town of the Unitarian congregation in a place, where he remained two years. He then became minister of the Unitarian congregation at Halifax in Yorkshire. In about three years he removed to London, where he resided during the major part of his life, chiefly occupied as classical teacher, and preaching only occasionally in the places of others: he never took charge of a congregation. Soon after he married the daughter of Dr. Abraham Rees; she died without issue in 1818. In 1817 he married again, and had two children, who survived him. He died January 10, 1827, in Great Conna Street, London, and was interred in the burying-ground of St. George's Bloombury. A few years before his death he received the diploma of LL.D. from the University of Aberdeen, and was soon afterwards elected a member of the Royal Society of Literature.

Dr. Jones was the author of several works, some of which are religious, chiefly in support or defence of the evidences of Christianity. Of these one of the most important was, "Illustrations of the Four Gospels," which has been frequently reprinted, the year before his death he removed to London, where he resided during the greater part of his life, chiefly occupied as classical teacher, and preaching only occasionally in the places of others: he never took charge of a congregation. Soon after he married the daughter of Dr. Abraham Rees; she died without issue in 1818. In 1817 he married again, and had two children, who survived him. He died January 10, 1827, in Great Conna Street, London, and was interred in the burying-ground of St. George's Bloombury. A few years before his death he received the diploma of LL.D. from the University of Aberdeen, and was soon afterwards elected a member of the Royal Society of Literature.

Dr. Jones's chief work, to which he devoted a great many years of his life, was his Greek and English Lexicon, which was published in 1835, in one volume, 8vo., and again in 1842. Dr. Jones was one of the first to introduce into this country the practice of teaching Greek through the medium of English instead of Latin; and the first Greek and English Lexicon for general use was Dr. Jones's. He afterwards published an enlarged edition for use of schools, "The Tyro's Greek and English Lexicon." There have since been several Greek and English Lexicons, not only in England, but in America. Soon after Dr. Jones's came out, Schrevelius's Lexicon was translated into English, and published by Valpy, a new edition of which came out in 1831. In 1836 Dr. Donoghue's Greek Lexicon appeared, and since those of Grove, Ewing, Dunbar and Barker, Hinkel's small School Lexicon, and lastly the Lexicon of Liddell and Scott, which is in one volume 4to., in small type, with many thousands of references, and has already (1858) passed through a second edition. It is based on the German work of Passow.

The success of Dr. Jones's Lexicon was very great, and a large impression was soon disposed of. The work, as might be expected, without its faults, was treated in the second number of the "Westminster Review." (Gent. Mag. 1827 : Journal of Education, vol. iii., 1823.)

Josquin, D'Arcy—Josquin, the eldest composer of the most ancient school of part-music —was, there seems little reason to doubt, a native of the Low Countries, though the honour of his birth is indirectly claimed by many Italian writers, whose date still remains a matter of importance; M. Fayolle thinks that the year 1450 may be assumed as the period at which he was born, and we are not inclined to differ from this opinion.

The portrait of Dr. Jones, Ockenheim, the eldest composer in parts on the continent," says Dr. Burney, "of whose works I have been able to find any remains," and much of whose reputation arises from having been the instructor of several celebrated scholars, is said to be related to each other as Blow and Purcell. On the monument of the former, in Westminster Abbey, it is recorded that he was master to the famous Mr. Purcell. It is probable that Dr. Jones was not inferior in the knowledge of his art; and this may have led to his having been thought a native of that country. Dr. Jones had a great many compositions, to which the frequent additions to which he was related, as that of Pratoni, or del Prato (a name very often used), may be attributed. It is certain that he was a singer in the pontifical chapel in the time of Sixtus IV., who sat in the papal chair from 1471 to 1494, for Adami speaks of him, in that capacity, in high terms, as well as of his compositions, calling him, "unomi insigne per l'invenzione." Quitting Italy, he went, according to Gessnerus, appointed Maître de Chapelle to Louis XII., for whom he composed much music (consisting of some amusing stories are told), and a motet or two or so contrivers were written at his request to be taken to the performance. Louis had made him a promise of a benefice, but neglected to redeem it. To remind the king the composer produced a motet beginning 'Messu est verit,' &c. This not proving very interesting, Josquin wrote another motet upon the words, 'Fortio men non est in terra viventium.' Louis then took the hint, bestowed a benefice, and the composer expiated his ingratitude in the observance of 'Bonitatem faciendi servae tuo, Domine.' But Gessnerus remarks that desire proved more inspiring than gratitude, for the two first works very much surpassed the last.

The time of Josquin's decease is not known. He was buried in the church of St. Gudule, at Brussels, where his effigy and epitaph are, we believe, still to be seen. He was a very voluminous composer, and many of his works remain to attest his learning and genius. He has given a splendid edition of them: Burney more than one example; and several are to be found in the British Museum. 'He may,' says Dr. Burney, 'be justly called the father of modern harmony, and the in- ventor of almost every ingenious device in composition; parts, nearly a hundred years before Palestrina, Orlando di Lasso, Tallis, or Bird, the great musical luminaries of the sixteenth century, whose names and works are still held in the highest estimation.' This great composer's style appears to me the true and genuine style of choral compositions.'

Jouvenet, Jean—Josquin—Josquin —Jouvenet, Jean, famed painter during the reign of Louis XIV., was born at Besançon, in 1644. He was first instructed by his father Laurent Jouvenet, but completed his studies in Paris, where he soon attracted the notice of Lebrun, who in 1764 procured him his election into the Academy of Painting. He was the first to introduce into France the style of Poussin, especially in the treatment of landscape, and was the author of one of the best paintings of the Academy collection. Jouvenet had obtained considerable distinction two years previously by his picture of the Lame Man healed, which was the celebrated "May Picture," and was kept in the Louvre, the Duc de Maine (1673). The May Picture was a painting which was formerly presented on the 1st of May of every year to the Virgin, in the cathedral of Notre Dame, by the Goldsmiths of Paris. The practice ceased in 1709. Jouvenet became successively professor, director, and perpetual rector of the Academy, and he was granted a small pension by Louis XIV. He died in 1717. The French boat of Jouvenet, as of Le Sueur, because he never visited Italy; and it is for the same reason, according to some, that he is censured by Count Algarotti, who, they say, had not seen an excellence in his work and was not interested in it. The works of Jouvenet are not brilliant in any respect or even attractive, yet they possess all the greater merits of a picture in more than an ordinary degree. His style resembles that of Nicolas Poussin, especially in composition and colour: and he excelled in light and shade, but in expression he was never great.

Jouvenet's last work, the Visitation of the Virgin, or The Magnificat, in the cathedral of Notre Dame, was painted with his left hand in 1717. He had a paralysis stroke in 1713 and lost the use of his right hand, but upon the first trial he found his left as obedient to his will as his right had been, and one of the many proofs that, in art, it is not the hand but the mind that requires the education.

There are ten of Jouvenet's pictures in the Louvre, some of which are his best works, as the Miraculous Draught of Fishes, and The Institution of Lazarus. Jouvenet, Jean, in the Church of St. John, and the Descent from the Cross. The first four have been worked in tapestry of the Gobelin, and they have all been engraven and sold to the public. There are other works, some of the best French engravings—by H. S. Thos- sain, J. Audran, E. Picard, L. Desplaces, A. Loir, A. Trovain, and others. There are works by Jouvenet, Jean, of the art of the modern age, and each picture of the Touron's mural paintings the principal are the colloidal frescoes of the Apostles painted on the dome of the church Des Invalides. (D'Argenville, Abrégé de la Vie des Peintres, t. i. 1752, p. 212. Art, &c.; Guiteau de Saint-Sever, Les Trois Siècles de la Peinture en France.) Jouvenet, Pierre, was born at Paris in 1643; he studied at Cassi and afterwards at La Flèche, with consider-
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able success, and was at an early age admitted a member of the Society of the Jesuits. He devoted himself chiefly to history, and was the author of the fifth part of the History of the Jesuits from 1691 to 1616, which was published at Rome in 1710. Though an agreeable writer, from the purity and elegance of his style, his facts are not to be implicitly relied on. So bigoted a writer is not the man to write an apology of the Jesuit Guignard, who was executed in the reign of Henry IV. of France, on account of his participation in a rebellion against the life of that monarch by Jean Châtel, who had been arrested on the preposterous charge of having written an apology of the Jesuit Guignard. An abridgment of his history was published at Liege in 1716, which is now rarely to be met with. A translation of a portion of the collection of Latin Harangues, pronounced by him on different occasions; his Latinity, though it has been blamed by Vallart, is generally admired. 2. A treatise 'De Arte Doencet et Doecaret,' which is in some esteem, but considered too offici-}

JUDGE (from the French juge, which is from the Latin iudicis). [JUDIX, P. C.] A judge in England and Wales is a man who presides in a court duly constituted, declares the law as applied, and pronounces the sentence or judgment according to law. There are judges of the three Superior Courts of Law at Westminster, judges in the Courts of Equity, a judge in the Court of Bankruptcy, judges of the Inns of Court, judges in the Ecclesiastical and Admiralty Courts, and some others. Some judges are called Recorders, and there are other names, but the name does not alter the nature of the office. When the judges simply are spoken of, they are usually understood to mean judges of the common law. The number of judges of the common law is fixed at fifteen. There are judges of the common law in five courts: five in the Court of Queen's Bench, five in the Court of Common Pleas, and five in the Court of Exchequer. There are at present five judges in the Court of Common Pleas, five in the Court of King's Bench, and five in the Court of Common Pleas; and five in the Court of Exchequer. The judges of the superior courts of law are appointed by the crown. They hold their office during good behaviour, but they can be removed by the crown on the address of both houses of parliament (13 Geo. III. c. 33), they continue to hold their office during good behaviour notwithstanding any demise of the crown, and their salaries are secured to them so long as they hold their office. The judges of the courts of Equity are also appointed by the crown. [CHANCELLOR, P. C.; CRANBERRY, P. C.]

By various acts of Parliament retiring pensions of a determin-}
mate period are provided for the judges of the three courts of law, and to the judges in Equity. The lowest retiring pension is £5000, and this amount may be given to all or some judges of the three courts. The highest retiring pension is £4000, and is given to the chief judge of the crown to the lord chancellor upon his resignation. But to be entitled to these pensions all the judges of the superior courts of law, and the judges in Equity, except the lord chancellor, must have held the office of fifteen years, unless bad health has prevented them from holding office so long. Judges of Courts of Record (Courts, P. C.) are not liable to prosecution for anything done by them as judges, but they may be prosecuted in parliament. Nor are they liable to an action for any error in judgment or for wrongful imprisonment, at least when they are acting within their jurisdiction. Judges are punishable for bribery, by loss of office, fine, and imprisonment.

The powers and duties of judges would form the subject of an elaborate treatise. It may be sufficient to observe that in England judges are appointed to enforce the laws and to protect the discharge of their duty and so make their office, as to make them entirely independent of all political and private influence, and they are paid well enough to secure them against the charges of any misconduct in any judge of the superior courts of law, or any judge who holds a high office, is now seldom or never heard of. The only question that can be raised is, whether the members of that body, who, whatever be the character of their persons are not sometimes appointed who, though not abso-

of any estate whatsoever, at law or in equity, or over which he may have any disposing power. All judgments are made binding on the persons against whom they are entered up, and against all persons entitled under the judgment creditor being entitled to the same remedies in a court of equity as if the debtor had by writing agreed to charge the lands, &c. The creditor is not however to proceed in equity to obtain the remission of principal debt or interest within one year from the time of entering up such judgment; and in case of bankruptcy, the judgment, unless entered up one year, is to give no preference to the judgment creditor beyond creditors who are entitled to the same in the court of bankruptcy. As to purchasers, mortgagees, or creditors prior to the time when the act came into operation; and with respect to purchasers for valuable consideration without notice, the rules of equity remain unaltered.

A judgment creditor, applying now for remedy to the Court of Chancery, will not be obliged to sue out the writ of execution for that which is agreed to be done is considered by a Court of Equity as actually performed, and the judgment creditor has therefore, by virtue of his judgment alone, an equitable estate. If however a judgment creditor, having obtained any charge, or being entitled to the benefit of any security, should, before the property so charged or secured is conveyed into money and applied towards the payment of the judgment debt, cause the judgment debtor to be arrested, the benefits of the security could not be pronounced in his absence, but this has been altered by the 11 Geo. IV. § 1 Wm. IV. c. 70, which enacts that upon trials for felonies or misdemeanors judgment may be pronounced whether the person affected be present or absent, except only in cases of information filed in the Court of King's Bench, or in cases of information filed by the attorney-general where he prays that judgment may be postponed. The judgment of the court extends to the life and liberty of the offender according to punishment decreed to the offence against which the judgment is delivered. In some cases it extends to the compensation by forfeiture of the lands or goods, or both, of the offender; others induce a disability of holding offices or of sitting in the House of Commons, and a large proportion are merely pecuniary by stated or discretion ary fines.

On the subject of judgments see Chitty's General Practice; Stephen, On the Principles of Pleading in Civil Actions; Sugden's Vendors and Purchasers; Prideaux, On the Law of Judgments as they affect Real Property.

JUGGARNATH, TEMPLE OF GOD Hindustan, is situated in the province of Orissa and district of Cuttack, in 19°. 47' N. lat., 85° 59' E. long., about 45 miles south of the city of Cuttack, and 311 south-west from Calcutta, direct distances. The temple, which is named after the Hindu idol Juggarnath (properly Jagannatha, or lord of the world), placed within it, stands on the coast of the bay of Bengal, and is a huge architectural mass, a sort of pyramidal tower, 200 feet high, built of the most durable stone, and covered with rough coating of chunam. It stands in the centre of a quadrangle enclosed by a high stone-wall, each side of which is 650 feet long. It is a very conspicuous land-mark, and is of considerable importance to navigators on the Baltic and uniform coast where it is situated. The country, to the distance of about a mile from the sea, is a waste of deep loam sand; farther inland it consists of low sand-hills covered by a thick forest of dwarf trees. The quadrangular inclosure is laid out for the convenience of the Temple of Somnath, in Guzerat, which was destroyed by Mahmoon in the 11th century. All the authorities agree in stating that it was erected in the 12th century.

The festival of Jagannath takes place every year, and the number of pilgrims is still very great, though much less than formerly, when Dr. Carey estimated them at 1,200,000. Three idols, gigantic busts, hideously ugly, are placed on pedestals which are concealed among the doors, the surfaces of which are resorted to by the throngs assembled. The statue is placed on a lofty platform, which rests on sixteen wheels, each 66 feet in diameter; and it forms alongside a monstrous car, or rath, 43 feet high and 35 feet square. Cables are attached to the chariot, and by these the pilgrims drag a about a mile and a half to its destination, and then back again, the whole procession occupying three days. The principal idol is a representation of Krishna, the others are Bal Rama his brother, and Subhadra his sister.

Mill, in his 'History of British India' (2. ii. c. 6), says,
being, it would appear, to charge his antagonist with holding the heretical opinions of Socinus. (Bosmet, Hist. des Variations, vol. iv. p. 64; vol. v. p. 250-258.) With all these defects Jurieu's last work is to be considered. His learning was most profound, he is generally exact in the citation of his authorities, and he had a special talent in discovering the weak point in the cause of his antagonists. In respect of style, he is perfectly correct, but he is at least his equal in polemical talent, and by some is considered his superior in erudition. Jurieu's private life was becoming that of a Christian minister: he was charitable to his poor, and exerted himself most benevolently for the good of his fellow creatures. He was particularly zealous in alleviating the sufferings of his exiled brethren. He died at Rotterdam on the 11th of January, 1718. His works, which are very numerous, were extremely popular in his day, and many of them are still held in high estimation by theologians of every school, on account of the great learning which they display. The principal of these are—1, 'A Treatise on the Criticism, 2, 'Defence of the Morality of the Reformed Church,' Hague, 1685, in answer to a work by Arnauld, entitled 'Moralitie destroyed by the Calvinists.' 3, 'A Treatise on the Change in Religion,' which was written to refute Bosmet's Exposition of the Catholic Faith.' 4, 'Letters against the History of Calvinism by De Mainmbour,' 2vols. 5, Another collection of controversial letters, entitled 'Moral and Political Inocence.' 6, 'A Treatise on the Church.' He considered it composed of all Christian societies who hold the common principles of the Christian faith. This treatise is sometimes accompanied by a Beverian, and sometimes by a Jansenist refutation of it. 7, 'A History of the Doctrines and Worship of the Jews, Amsterdam, 1704, with a Supplement published in 1706. 8, 'A Treatise on Mystical Theology,' composed on the occasion of the well-known controversy between Feénelon and Bosmet.

JURISDICTION. This term is the Latin word Jurisdiction, which simply signifies the declaration of jus or law. It was employed by the public magistrates to declare the law. The whole office (officium) of him who declared the law was accordingly expressed by the word Jurisdiction. (Dig. 2. tit. De Jurisdictione.) Jurisdiction was either voluntary (voluntaria) or litigant (contentiosa). The jurisdiction voluntaria related to certain acts, such as for instance those forms of manumission and adoption which must be done before a magistrate in order to be valid. The jurisdiction contentiosa related to litigation, and such legal proceedings were said to be in jure, before the magistrate, as opposed to the proceedings before a judge, which were said to be in judicio. The magistratus was said 'in judicio' or 'red rerum, who had exercised his function, and 'qui Romae jus dict' are accordingly convertible terms. Jurisdiction in England means an authority which a court of law or equity has to decide matters that are litigated before it. Such courts are commonly called superior courts. Where the parties were deprived of the permission to give public instruction in that town, he retired to Rouen, and from thence went to Rotterdam, where he was appointed Professor of Theology. In that city the ardour of his zeal soon drew him into controversy with Bayle, Basset, and Saurin; in the heat of which he manifested the same rancour which unfortunately disgraces most of his polemical writings. He allowed himself likewise to fall into various errors by too many indulging a curious and lively imagination in the interpretation of prophecy. In his Commentary on the Apocalypse he even predicted the establishment of Protestantism in France during the year 1660. Those who differed from him in opinion, however high their character for learning and piety, he treated with a most unbecoming severity. Godin and Hammon, perhaps the two greatest theologians of that age, because they differed from him on the subject of the Antichrist predicted in the Book of Revelations, he styles 'the disgrace of the Reformed Church, and even of Christianity. The same spirit is seen in his polemical controversy with Bosmet, Bishop of Maux, whom he does not scruple to accuse of falsehood and dishonesty, though, on the other hand, it must be allowed that the recriminations of this celebrated defender of the church may be, if not politely expressed, at least detestate of truth; the great object of Bosmet
guardians of the realm, during his absence; and similar appointments were very frequent under the early Norman and Plantagenet kings. There is a commission of a Custos Rotundi in Rymer of the reign of John. One by Edward I. to the Earl of Pembroke describes the powers of the office in terms which imply that it had long been familiar, as extending over all the counties of the realm; but its precise nature is uncertain; it may have been a custodiam potestatis dictum custodiam pertinent; and the same words are common in subsequent commissions. And down to the present time similar words are found in various commissions, and with more or less extensive powers applied to various officers and persons, whether they be protectors, lieutenants, or locum tenens, and regent, have been among the other names by which they have been known. Republican governments have been accused of having no king or queen, but this has been sometimes named by the preceding successor of the crown; but in modern times such arrangements have been usually made by statute. Coke remarks (4 Inst. 58) that the methods of appointing a guardian or regent have been so various, that the surest way is to have them made by authority of the great council in parliament.

The most familiar case of the appointment by the crown of a representative to exercise the supreme executive power, not in a colony or dependency, is that of the appointment of a governor for Ireland, who has commonly borne the name of the Lord Lieutenant or the Lord Deputy; or of a council of government, to be styled Council of State.

The governor-general of Ireland under the crown has been styled at different times custos (Keeper or guardian), justiciary, warden, procurator, seneschal, constable, justice, deputy, and lieutenant. The last was reserved during the time of the king's custumary. Formerly, upon the avoidance of the king's lieutenant for Ireland by death or otherwise, the privy council there was authorized to elect a successor, with the restriction that he should be an Englishman and no spiritual person, who held office till the king appointed another. The antient powers of this office were almost regal; he executed every act of government without any previous communication with England; and when he left the country he was entitled to the custody of the great seal. From about the time of the Revolution, however, till after the commencement of the reign of George III., the lord-lieutenant resided very little in Ireland; in several instances the person appointed was never sent out; in other cases he went over once in two years to hold the session of parliament; and the government was very often left in the hands of lords justices, without a lord-lieutenant at all. In modern times the appointment of lords justices for Ireland has only taken place on the occasional absences of the lord-lieutenant, and during the interval which has sometimes occurred between the demise of one lord-lieutenant and the appointment of another.

The lords justices have been represented as being the executive magistrates of Ireland, the persons who can make such appointments, and the joint judges of the inferior courts.

In England lords justices and regencies have been repeatedly appointed since the Revolution, on occasion of the king going abroad; and these appointments have been made by royal letters patent under the great seal, in the same manner as the lords-lying-treasurer and lords justices of Ireland. When the king was abroad, however, the aid of parliament has been called in for certain purposes. When King William went over to Ireland in 1689, he of his own authority appointed the administration of the government to be in the hands of the queen during his absence out of the kingdom, not, however, we suppose, by letters patent, but merely by declaration at the council-table; and at the same time an act of parliament was passed, 1 & 2 Wm. and Mary, sess. 2, in the preamble of which that declaration of his majesty's pleasure was recited, and it was enacted, that whenever and as often as his majesty should be absent out of this realm of England, it should and might be lawful for the queen to appoint such number of persons as she should think fit, in the names of both their majesties, for such time only, during their joint lives, as his majesty should be absent. This act was considered as necessary or expedient, in consequence of which it was also provided that his majesty's pleasure was placed by the Act of Settlement, which had declared that the entire, perfect, and full exercise of the regal power and government should be only in and executed by his majesty in the persons of himself and his heirs. The proclamation was at the same time provided, 'That as often as his majesty shall return into this kingdom of England, the sole administration of the regal power and government thereof, and all the duties of his government, and of his magistracy, shall be by the queen's pleasure and the great seal annexed, shall be in his majesty only, as if this act had never been made.' After the queen's death lords justices were repeatedly appointed by King William, on occasion of his going abroad, under the great seal, namely, 6th May, 1692; 22nd April, 1697; 16th July, 1698; and 31st May, 1699.

One of the provisions of the statute of 12 & 13 Wm. III. (passed in 1700) for settling the succession in the House of Hanover, was, that the possession of this crown shall go out of the dominions of England, Scotland, or Ireland, without consent of parliament. This clause, however, was repealed in 1716, by 1 Geo. I. stat. 2, c. 61. The repeal was made by act and statute, whose 'impunity to visit his German dominions,' says Coke in his 'Life of Walpole,' '77, 'now became so great as to render him and others of great property, and impiously to demand indulgence.' The ministry, continues the historian, 'were considerably embarrassed on this occasion; and drew up a strong remonstrance, representing the inconvenience which would result from the proposed journey. The remonstrance, however, not only failed of success, but so far exasperated the king, that he declared he would not endure a longer confinement in this kingdom.' It was thought more respectful to his majesty to obtain a repeal of the restraining clause at once, than to ask parliament merely for the leave of absence; and the bill passed through all its stages in both houses without a dissentient voice, being only obliged to the viceroy of France, the duke of Louviers, and the Whigs adverse or frightened to offend the king. His majesty, who was at variance with his eldest son, now interposed another difficulty, refusing to intrust the government to the council of gentlemen. An amendment of this kind was brought in, and a new bill was passed, authorizing the king to appoint any number of persons with him in the commission, and also limiting his authority by the most rigorous restrictions. Upon this point, however, he yielded at last to the representations of the ministers, who concluded a long expostulation of reasons against his leaving the kingdom at all at that crisis by stating, 'Upon a careful perusal of the precedents, finding no instance of persons being joined in commission with the Prince of Wales in the absence of the regent, the king resolved to extend such restrictions upon such commissions,' they were of opinion that the constant tenor of antient practice could not conveniently be receded from. (See the paper in Coke, ii. 51-54.) Upon this the king submitted to give the privilege of appointment of a commission of affairs; 'yet,' says Coke, quoting from the work called 'The Political State of Great Britain,' 'he appointed him Guardian of the Realm and Lieutenant, an office unknown in England since it was enjoyed by Edward the Black Prince.' In point of fact the title given to the prince in the original Latin commission was Custos Regni nostri et Locum tenens, which were the same words that had been commonly used in all such commissions down to the reign of Henry VII. With this difference only, that one of the two titles (more frequently Custos Regni) was alone employed. The earliest use of the term regent appears to have been in a commission from Henry VIII. to Queen Katherine Parr, who was next in line after Catherine of Aragon, to Boulogne in 1544, in which she is styled Rectoris et Gubernatrix Regni nostri. Queen Mary, the wife of William III., whose case is the subject of the present article, had no commission; and being queen regnant in her own right, she was not even popularly styled regent.

When George I. went abroad the next time, in May, 1719, he intrusted the government during his absence not to a regent, or any single person, but to thirteen lords justices, namely, the Archbishop of Canterbury and the principal officers of the state. A translation of the commission issued on this occasion, or rather, of the warrant to the attorney-general to prepare the commission, has been printed in the report of a committee of the House of Commons which sat in December, 1788, and affords us probably the most complete and authentic form, in a printed form, of any of these documents; and we shall here give a complete transcript of the present article. The committee that state that they found no entry of any earlier commission, except of the one issued in 1699, and that that was nearly the same with that of 1719, which appears to be the sole original, or the only one that has been subsequently issued. The commission begins by reciting that his majesty had 'determined, for divers weighty reasons, speedily to go in person beyond the seas.' The persons commissioned are 'the lords justices of our said kingdom of Great Britain, and our lieutenants in the same, during our absence out of our said kingdom, or till further specification in these present commission.' In the names of all of our pleasure, 'to execute the office and place of guardians, &c., and to order, do, and perform all and every act and acts of
government and administration of government, and all other matters and things whatsoever, which, by virtue or by reason of law or usage or custom or place, or may by lawfully ordered, done, or performed. Power is afterwards specially given to keep the king's peace, to cause the laws and customs of the kingdom to be specially observed by all, to summon and order, to hold and upbraid the parliament of the kingdom, to summon, hold, and execute, and likewise to summon and hold another parliament and other parliaments, and the same to continue, prorogue, and dissolve it, and likewise to summon and hold another parliament and other parliaments, and the same to continue, prorogue, and dissolve it; also, for and in respect of the command, the king's seal, royal signet, and other necessary authority to the king and his officers, and to the queen and her officers, and to summon and hold the Privy Council, and to appoint committees of the same; with the advice of the Privy Council, to issue proclamations, and to do and perform all other things which have been usually done, or may be done, by us, by or with the advice of the same; to appoint and authorize persons to treat with the ambassadors, commissioners, and ministers of emperors, kings, princes, republics, or states, and to make and conclude treaties, conventions, and leagues thereupon; to confer, grant, and present to all benefices, dignities, and ecclesiastical promotions, which are in the crown; to issue commissions, orders, and warrants, under the privy seal or otherwise, to the treasurer, or commissioner of the treasury, and other officers, for and in respect of the collection, levying, appropriating, and expending royal revenues and royal treasure and revenue; to command the army; to suppress insurrections and insurrections to execute and employ martial law in time of war, if that should happen; in like manner to command and employ the naval forces of the kingdom; to appoint and to discharge from all offices at the disposal of the crown; to grant pardons for high treason and all other crimes and offences; and finally, to do all these things in Ireland as well as in Great Britain.

This enumeration is probably the most authentic compendium that has been published of the powers of government, ordinary exercised by the crown. It does not, however, profess to be an enumeration of all the powers resident in the crown; and it will be especially observed, that (besides, perhaps, some appertaining to the office of supreme head of the church) the power of creating peers and conferring honours is not made over to the lords justices. That is a power which, we believe, never has been delegated, or attempted to be delegated, if we except only the case of the patent granted by Charles II. of Ireland, in 1644, to Lord Herbert (better known as the Earl of Glamis). After persecution, he was compelled to resign by the interference of the House of Lords.

The Lords Justices are further required in the commission of 1719, in the execution of their powers, punctually to observe his majesty's will and pleasure, as it might be from time to time more clearly and distinctly expressed in instructions signed by the royal hand; and the commission was to be accompanied by a set of instructions, also printed in the Report of the Committee of 1788, and stated to be nearly the same that had been issued, as far as was known, on similar occasions before and since. The rules prescribed are twenty-one in number, the most important things directed in which are, that no livings or benefices in the gift of the crown which may become vacant shall be disposed of without his majesty's directions to the persons to be signified from beyond the seas under the sign manual; that no orders or directions concerning the disposition of money at the treasury shall be given before his majesty's pleasure shall have been signified thereupon; that no orders must be given for dissolving the parliament, or calling a new one, without special signification of the royal pleasure. The same restriction is put upon the exercise of the power of pardoning, and some others. In case it should be necessary or expedient for the public service, the Lords Justices are authorized to fill offices immediately, and also to preserve criminals; and they are permitted to continue the sessions of the parliament until they shall otherwise be directed under the royal sign manual, and to summon the privy council to meet as often as they shall see occasion.

The government was in the same manner intrusted by George I. to Lords Justices when he again went abroad in 1720, 1728, 1729, and 1727. It is strange that the Report of 1788 should notice only the second of the several regencies of Queen Anne, but not even so much as to intrust the regency to George II. Her majesty so long as she lived was always intrusted with the administration of the government when the king went abroad; which he did in 1729, in 1732, in 1738, in 1746, in 1754, and in 1760. To enable her majesty to be regent of this kingdom, during her majesty's absence, without taking the oath; on the 15th of May thereafter, according to Salmon's Chronologie en Anglee, the queen, now regent, and George II. in his own person, viz. by virtue of the royal title, did certify the queen and lady of the realm, viz. the queen regnant, and George II. in his own person, viz. by virtue of the royal title, did certify the queen and lady of the realm, viz. the queen regnant, curtailing a guardian and lieutenant of the kingdom during the queen's absence; and the same authority states she to have been appointed guardian in 1729, and regent on the two other occasions. The queen was also to sign the bills which were to be enacted in such parliaments, according to the laws and statutes of the kingdom of Ireland; to summon and hold the Privy Council, and to appoint committees of the same; with the advice of the Privy Council, to issue proclamations, and to do and perform all other things which have been usually done, or may be done, by us, by or with the advice of the same; to appoint and authorize persons to treat with the ambassadors, commissioners, and ministers of emperors, kings, princes, republics, or states, and to make and conclude treaties, conventions, and leagues thereupon; to confer, grant, and present to all benefices, dignities, and ecclesiastical promotions, which are in the crown; to issue commissions, orders, and warrants, under the privy seal or otherwise, to the treasurer, or commissioner of the treasury, and other officers, for and in respect of the collection, levying, appropriating, and expending royal revenues and royal treasure and revenue; to command the army; to suppress insurrections and insurrections to execute and employ martial law in time of war, if that should happen; in like manner to command and employ the naval forces of the kingdom; to appoint and to discharge from all offices at the disposal of the crown; to grant pardons for high treason and all other crimes and offences; and finally, to do all these things in Ireland as well as in Great Britain.

Nevertheless, no provision such as had been customary on such occasions was made for the exercise of the royal authority, either when her present majesty made her short excursion to the French coast in 1843, or when she made her last more extended visit to Germany (in August and September, and October and November, 1845). The commission in which the writer, after stating that Lord Eldon considered it indispensably necessary that Lords Justices should be appointed on that occasion, adds:—' One good effect arose from their appointment, that the lords justices continued during his (the king's) absence signed an immense number of military commissions and other documents, which had been accumulating since his accession to the throne.' This writer contends that 'the royal authority of the English monarch cannot be personally exercised in a foreign country.' "We take it," he adds, 'to be quite clear, that a patent sealed with the great seal in a foreign country would be void. To guard against any such irregularity, the law requires that the patent shall state the place where it is signed and sealed as apud Westminsterium.'

It ought to be mentioned that the seven persons appointed in 1703, as the Lords Justices, were the Duke of Marlborough, the Duke of Ormonde, the Duke of Queensberry, the Duke of Cumberland, the Earl of Shrewsbury, and the Duke of Buckingham. In 1703, the 1st August, the 6 Anne, c. 7, to administer the government along with other persons whom the new king or queen should have named, in case of his or her absence at the time from the kingdom of Great Britain: and after the death of his (the king's) wife, the king, in his own person, was called regent of the kingdom, and in the common accounts. These Lords Justices (twenty-six in all), who actually came into office on the death of Queen Anne, 1st August, 1714, and continued for three years, had the privilege of the kingly office, enjoyed more extensive powers than any others that have
been appointed, at least in modern times. They were author-
ized, in the name of the successor, and in his or her stead,
to use, exercise, and execute all powers, authorities, matters,
and acts of government, and administration of government, in
as full and ample manner as such next successor could use or
execute the same if she or he were present in person within
this kingdom of Great Britain, until such successor should
arrive, or otherwise determine their authority. The only
restrictions laid upon them were, that they were not, without
direction from the 'queen or king,' to dissolve the parliament;
and that they would subject themselves to the pains of high
treason if they gave the royal assent to any bill or bills for
repealing or altering the Act of Uniformity, or the Act in
the Establishment and Maintenance of the Presbyterian
Church Government in Scotland.

We are not aware that these facts have ever before been put

together. The most important of them have been derived
from the Report of the Committee appointed by the House of
Commons in 1788, 'to examine and report precedents of
such proceedings as may have been had in the case of the
personal execution of the royal authority being prevented or
interrupted by infancy, sickness, infirmity, or otherwise,'
11-42. See also, besides the other sources that have been
already referred to, an article 'On the Regency Question,'
46-80. And some particulars may be gleaned from the ac-
counts of the proceedings in the two Houses of Parliament on
occasion of the king's illness in 1788, as reported in the
'Parliamentary History,' vol. xxvii. pp. 655-1297; and from
the discussions on the Regency Bill from the beginning of
November, 1810, to the middle of February, 1811, which
nearly fill the 18th volume of the 'Parliamentary Debates.'

One of the speeches which attracted most attention on the
latter occasion for its argument and research was afterwards
published in an authentic form; that delivered on the 31st of
December, 1810, by John Leach, Esq. (afterwards Vice-
Chancellor).

JUSTICIARY COURT in Scotland. To render the

historical article on this subject under the head of JUSTICIARY

[P. C.] fully intelligible, it may be mentioned that the High-
Court of Justiciary is the supreme criminal court in Scot-
land. It consists of the Lord Justice General, Lord Justice-
Clerk, and five other judges of the Court of Session. It sits
at Edinburgh, from time to time during the year, according
to the extent of business to be transacted. Offences com-
mitted in Edinburgh and within the district of the Leithians
are tried before this court, and in cases where in other parts
of the country waiting for the next Circuit Court would create

much delay, or where there is any other ground of ex-
pediency, the trial may proceed before the Central Court.
Other trials in the provinces proceed before the circuit courts.
These are held in spring and autumn, each by two judges
deputed by the High Court of Justiciary. The southern

circuit is held at Jedburgh, Ayr, and Dumfries; the western,
at Glasgow, Inverness, and Stirling; and the northern at Perth,
Aberdeen, and Inverness. An additional circuit is held at

Glasgow in winter. Questions may be certified from the
circuit courts to the High Court of Justiciary, that no decision once
given can be reconsidered either by the court pronouncing it
or a Court of Review. This principle is liable to many ob-
jections, but it is productive of one benefit, that no trial is
thrown away by the subsequent discovery of flaws in initial
procedure. Before the case goes to a jury, a judgment is
pronounced 'finding the indictment relevant,' and virtually
declaring that the initial procedure is regular; that the charge
is properly laid, and that the offence if proved is punishable.
If there be any objections to the regularity of the proceedings,
they must be stated before this judgment, which when once
pronounced is final. All cases before the Court of Justiciary
are tried by a jury of fifteen, a majority returning the verdict
where they are not unanimous. It has jurisdiction in all the
more serious offences except high treason, which is adjudicat-
ed in the English manner by a Court of Oyer and Ter-
miner.

JUSTIFIABLE HOMICIDE. [MURDER, P. C.]

JUVENIUS CELSUS. [CELSUS, P. C. S.]

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KAFFA, a country in the eastern parts of Africa, of which we have only lately got some information, and which hitherto has been known by any European traveller, so far as is well known. It is said to be of considerable extent, larger than the country of the Shoa [Astrinmia, P. C. S.], and appears to occupy the space between 3° and 5° N. lat. and 39° and 54° E. long. It contains many mountains, which are separated from one another by wide valleys. Numerous watercourses drain the country, and all of them join the Goshap, a large river originating in several branches to the south and west of Kaffa, which probably falls into one of the rivers whose embouchures have been recognised on the coast of Zanzibar. On the north of Kaffa is Enare, and on the west a wilderness, in which numerous herds of large quadrupeds (elephants, giraffes, &c.) are found. The country is fertile, and partly well cultivated. Cotton is grown to a great extent. The coffee-tree is there, as well as in the neighbouring country of Enare, indigenous and a forest-tree. It is not stated that coffee was an article of export, but it is thought that the coffee-raisers in these parts have derived its name from this country, as the Arabs assert that it has been transplanted to Yemen from that part of Africa.

The capital is Socone, a town which, according to the accounts of African travellers, has between 6000 and 7000 inhabitants. This place and some others are visited by the merchants of Enare, who exchange their goods (rock-salt, copper, and some lime-stone brought from Gondar), for cotton, cotton-clotth, which is made in the country, and slaves; this is the only way by which the inhabitants dispose of their produce and obtain foreign goods. The inhabitants, it is said, call themselves Christians, but none of the practices by which the Abyssinian church is distinguished are in use among them.

(Kraft, Bericht von dem Flusse Goshap und den Ländern Enare, Kaffa, und Dedo, in the Monatsschriften der Berliner Gesellschaft für Erdkunde.)

KAINE, LE HENRI-LOUIS, a French actor, so often spoken of in the memoirs of French literature in the middle of the eighteenth century, that some account of him may be useful. He was born in 1728, and died in 1778. He was a protégé of Voltaire, who observed the natural strength of his histrionic genius, and removed him from the humble operative profession. He acquired his chief celebrity in the characters of Voltaire's plays; yet, owing to a singular series of events, that author never saw him on the stage. He was unable to make his début until seventeen months after Voltaire's departure for Prussia, in 1750, and on the author's return, after an absence from Paris of twenty-eight years, he found the actor about to be buried. Louis XV. stamped the reputation of Le Kain, by a lettre de cachet; not qu'il ne pleure gun. Like the English actor to whose name that of Le Kain bears a great resemblance, he was small in person, and his success arose from his power of representing deep passion and vehement emotion. The character of his acting was wovell, and while it fascinated the audience, it did not at first satisfy the critics, who termed him le convulsionnaire. He was critical and accurate in costume, and attended minutely to its topical and chronological applicability.

(Biographie Universelle.)

KALEIDOSCOPE, a name compounded of two Greek words (καλλος and στρατη), and denoting the exhibition of beautiful forms, is the designation of an optical instrument which was invented by Dr. (Sir David) Brewster, and made public in 1817.

About three years before that time Sir David Brewster, being engaged in making experiments on the polarization of light by reflection from plates of glass, observed that when two plates were inclined to one another, and the eye of the spectator was nearly in the produced line of the common section of their planes, the farther extremities of the plates were multiplied by successive reflections so as to exhibit the appearance of a circle divided into sectors, also that the several images of a circle near those extremities were circularly disposed about the centre. From these circumstantes were suggested the idea of the construction of an instrument of the kind above named.

It may be observed, however, that the multiplication of the image of an object by successive reflections from mirrors in-
The angle $\angle ABC$ be $2\theta$ of four right angles, in which $m$ is any term in the series of even numbers 4, 6, 8, 10, &c., the number of mirrors will be $m$, and each of them will be equal to $\angle ABC$, while $C$, the appearance of the line in which the mirrors meet each other, will, as in the figure, bisect the angle which is opposite to $\angle ABC$; also if $m$ be any term in the series of odd numbers, 3, 5, 7, &c., the number of mirrors which will be $m$, and each of them will be equal to $\angle ABC$, while $C$, the appearance of the line in which the mirrors meet each other, will coincide with the line in which the two lowest sectors join one another. It may hence be understood that if a flat object placed in the sector $ABC$, with its plane perpendicular to the mirrors, have its bounding-lines similarly situated with respect to $A$ and $B$, the reflected images will be equidistant; and that the number of images which will constitute one geometrical pattern, whichever the value of $m$ be odd or even; but if the bounding-lines are not similarly situated with respect to $A$ and $B$, the reflected images will not, in the two lowest sectors, unite so as to correspond to the images in the other sectors, unless $m$ be an even number.

The second figure represents a pattern produced by the objects represented in the sector corresponding to $ABC$ in the first figure.

In order that the whole pattern in the field of view might possess perfect symmetry about the centre $C$, it would be necessary that the eye should be exactly in the direction of the line in which the glass plates meet one another; but in such a situation the reflected images would not be visible: if the eye were far above the line of meeting, the visible field of view would be sensibly elliptical, and the brightness of the field of view would be less; but if it followed, so as to be near the small ends of the mirrors, and very little above the line of their junction. Again, it may be readily understood that, in order to permit the reflected images of objects to be symmetrically disposed about the centre of the field of view, the object should be exactly in a plane contiguous to the mirrors at the extremities which are farthest from the eye; for in the line in which the planes of glass meet each other, appearing to pass through the common centre of the visible sectors, if the object were placed on that line of junction, and either between the eye and those extremities or beyond the latter, it is evident, the eye being about the line of meeting, that the apparent or projected place of the object would not coincide with that common centre, but in the former case would appear below, and in the latter above, that centre. The length of the mirrors should be such that the object in the sector $ABC$ may be distinctly visible; the eye may, however, if necessary, be assisted by a convex or concave lens.

The first kaleidoscopes constructed by Sir David Brewster consisted simply of the two mirrors, which were fixed in a cylindrical tube; the objects were pieces of variously coloured glass attached to the farther ends of the mirrors and projecting into $\angle ABC$ between them. Some of these objects were placed between two plates of very thin glass, and held by the hand or fixed in a cell at the end of the tube. In some cases these plates were moved across the field of view, and in others they were turned round in the form of a glass tube. The pieces of coloured glass or other objects which were situated in the sector $ABC$ were, by the different reflections, made to appear in all the other sectors; and thus the field of view presented the appearance of an entire object or pattern, all the parts of which were disposed with the most perfect symmetry. By moving the glass plates between which the objects were contained, the pattern was made to vary in form; and pleasing variations in the lights were produced by moving the instrument so that the light of the sky or a lamp might fall on the objects in different directions. When the objects in the sector $ABC$ are confined near its upper or lower edge, a form of pattern is obtained, and, on placing the two mirrors parallel to one another, the successive reflections of the objects produce one which is remarkably beautiful. Sir David Brewster subsequently found means to obtain multiplied images of such objects as flowers, trees, and even persons or things in motion: and thus the instrument was greatly increased in utility. They fixed a frame at a right angle to the mirror, so that the two mirrors might be fixed in a tube as before, but the tube was contained in another from which, like the eye-tube of a telescope, it could be drawn at pleasure towards the eye: at the opposite end of the exterior tube was fixed a glass lens of convenient focal length, by which there were formed images of distant objects at the place of the sector $ABC$. These images were named objects which, being multiplied by successive reflections from the mirrors, produced in the field of view symmetrical patterns of great beauty.

Some kaleidoscopes have been executed in such a manner that the two mirrors may be placed at any required angle with one another, by which means the images in the visible field of view may be greatly increased. The flat glasses of the mirror are also of being constructed so that the multiplied image may be projected on a screen, and thus made visible at one time to many spectators. In order to obtain this end, the rays of light from a powerful lamp are, by means of a lens, made to fall upon the object in $ABC$ at the farther extremities of the two mirrors; and at the eye-end of the instrument is placed a magnifying lens of such focal length that the emergent cones of light from the emergent pencils may converge on the screen: there will thus be formed on the latter a magnified image of the whole pattern. The tube containing the glass plates frequently mounted on a stand having a ball-and-socket joint, on which it may be turned in any convenient direction; and the instrument being thus supported, the figures in its field may be easily sketched by a skilful artist, who by means of such an apparatus may be greatly assisted in designing beautiful patterns.

Sir David Brewster's account of his invention is contained in his 'Treatise on the Kaleidoscope' (Edinburgh, 1819): but Dr. Rogot has shown ('Annals of Philosophy,' Vol. xli.) that the properties of the instrument may be greatly extended by employing, instead of two, three and even four plane mirrors, united together at their edges so as to form a hollow prism, or a frustum of a pyramid, the reflecting surfaces being directed towards the instrument. The objects which are thus made visible by means of Kaleidoscopes, the instruments constructed with three plane mirrors appear to produce the most pleasing effects; the mirrors may be disposed so that a section perpendicular to the line of view shall be a right-angled triangle, a right-angled triangle, or a right-angled triangle having its two acute angles equal to 30° and 60°. The first disposition of the mirrors affords regular combinations of images in three different directions which cross each other at angles of 60° and 120°; and to instruments of this kind Dr. Rogot gave the name of Triascope. With the second disposition the field is divided into square compartments having the hypotenuse of the triangle for their sides, which are called Polycentric. The third disposition exhibits a field of view divided into hexagonal compartments; and hence the instrument is designated a Hexascope.

Sir David Brewster obtained a patent for the kaleidoscope, and several opticians of London and other places were duly authorized by him to execute and sell them; but the refinement of taste are too often disregarded in the imitation of works of art; and, apparently, the public did not adequately encourage the manufacture of the instruments of a superior kind; while, in violation of the patent, imitations of the kaleidoscope, refined in form and execution, were sold at low prices, by unprincipled persons, in such numbers that it is doubtful whether the distinguished philosopher to whom optical science is so many accounts so highly indebted derived any pecuniary benefit from his invention.

KALENDAR, REVOLUTIONARY. It has been pointed out that there is a mistake in the commencement of the French revolutionary years as given in Year P. C. On examination we find that not only the article cited, but many other works give an account of this calendar which is more or less incorrect. The decree of the National Convention, which fixed the new mode of reckoning, were both vague and insufficient, so that it is no wonder that many detailed accounts neither agree with each other nor with the truth. To learn what the truth was, we have recourse to a French work, in its sixth edition: 'Concordance des Calendriers Républicains et Antique,' par L. Simonet, Paris, 1795, 4to, pp. 1-8vo. This work puts every day of every year, from an Ill. to an XXII. both inclusive, opposite to its day of the Gregorian calendar: it also gives the decrees of the National Convention. By these decrees it appears that the year is to begin at the midsummer of Paria Observatory which precedes the true autumnal equinox. It is to consist of 365 days, with 12 months of 30 days each, the 31st day of each month being the 31st day, and 5 complementary days, which were tastefully called sanseculotides (a name afterwards repealed). A sixth complementary day was to be added, not according to any rule, but at the pleasure of the President of the Directory, and although it was stated that it would be ordinance necessary to add this 366th day once in four years, yet it was not even stated in what particular coming years the necessity
For instance, what is 14 Floral? An XII. The republican year begins Sept. 24, 1803, so Floral falls in 1804, which is Gregorian leap-year. Look at the third Table, and when the year begins Sept. 24, the first of Floral is April 21; consequently, in 1803, which is June 4, 1804, in the French calendar? The year is not Gregorian leap-year; and An VIII. contains it, which begins Sept. 23. Look in the second Table, and in such a year it appears that June 1 falls on the 12th of Prairial; therefore June 17 is Prairial 28.

KALUGJEW is a considerable island in the circle of Mesen, in the Russian government of Archangel, and situated in the north part of the White Sea. It lies between 68° and 69° 40' N. lat., and 47° 30' and 48° 10' E. long., and is about 60 miles in diameter. The surface is undulating; it has some low mountains, which rise in the centre, two small rivers, and several brooks of fresh water. The surface is covered, as in Mesen, with mosses; there are extensive morasses; the ground bears nothing but berries, some antiscorbutic plants, and stunted bushes. The surrounding sea is shallow, but swarms with fish; the coast abounds in seals, walruses, and other such animals. The cliffs are covered with an incredible number of sea-birds; the interior is full of polar-bear foxes, &c. Except a few Samoils there are no settlers. Rebekahh, a colony of Russian believers, live in their own way. They feed themselves here in the 18th century; but soon left the island. At present it is only frequented by fishermen and seal-hunters from Mesen and Archangel. The little island of Plotki-Koeky and some others are near to Kalugjew.

(Hassel, Handbuch, vol. xi.; Canadisch, Lehrbuch.)

KALMIA, a genus of plants named by Linnaeus in honour of Peter Kalm, professor at Abo in Sweden. It has a small five-leaved capsule, the calyx, and the angulhar incurved open limb having ten nitches in its sides. The capsules five-celled and many-seeded. The species are evergreen shrubs with alternate or verticillate leaves.

K. latifolia has its leaves on long petiolo, scattered or three in a whorl, smooth and green on each side. It is a native of N. America from Canada to North Carolina, on the sides of stony hills. It has various names in the United States, Laurel Ivy, Spoonswood, Calico-bush. The flowers are red, and when in blossom have a very elegant appearance. The leaves of this species are said by Barton to be poisonous to man and beast, but their action can be but feeble and unimportant, for animals are known to feed on the plant without any evident effect. Bigelow however states that the flesh of pheasants having eaten this plant has produced some cases of severe disease attributable to this cause alone. The flowers of the K. latifolia exude a large quantity of sweet nectarous juice, which is greedily collected by bees and wasps, but the honey formed from it is injurious to man, and the juice, if swallowed itself, will produce an intoxication of an alarming kind. A brown powder which adheres to the shoots and branches is used as a stimulant by the Americans.

K. angustifolia, Haulm-leaved Kalmia, has petioloate leaves, scattered or in a whorl, oblong, obtuse, rather rusty beneath, coryza laterals, bracteoles linear, flowers and calyxes clothed with glandular pubescence. It is a native of North America from Canada to the Carolinas, in bogs and swamps, and sometimes in dry mountainous lands. It is a shrub one or eight feet in height, with dark red flowers. It is called Sheep-Laurel in North America, as it is supposed to be very injurious to sheep. Several varieties of this plant with lighter and darker flowers have been described. There are several other species, all of them natives of North America. They are all remarkable for the irritability of their stamens, and each of the stamens has a little cavity formed for it in the corolla, to serve as a receptacle to the anther.

They are handsome shrubs when in blossom, and are great favourites in gardens and shrubberies. They grow best in a peat soil, or they may be planted in a very sandy loam or vegetable loam. They may be propagated by layers or seeds. When the seeds are used they should be sown early in the spring in flat pans or pots filled with peat earth, and very slightly covered over; the pots may then be set in a close frame. To the front of a hole made, till the plants come up, when they may be transplanted to other pots, which should stand in a close frame till they have struck root; they should then be hardened to the air by degrees.

KATER, HENRY, an English mathematician of some eminence, and an excellent practical philosopher, was born at Bristol, April 16th, 1777. But of his early life very little is

<table>
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<tr>
<th>Sept. An I.</th>
<th>22, 1792</th>
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<tr>
<td>Sept. An II.</td>
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<td>22, 1793</td>
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<td>Sept. An VII.</td>
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<td>Sept. An VIII.</td>
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<td>Sept. An IX.</td>
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<td>XXV.</td>
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<td>Sept. An X.</td>
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<td>XXVI.</td>
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<td>Sept. An XI.</td>
<td>22, 1803</td>
<td>XXVII.</td>
<td>24, 1813</td>
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When the Gregorian year is not leap-year the beginnings of the months are as follows, according as the republican year begins on Sept. 23, 23, or 24:

| Vendsém. | Sept. 23, 23, 24 |
| Brunsam. | Oct. 23, 23, 24 |
| Fírmat. | Nov. 23, 23, 23 |
| Nivos. | Dec. 23, 23, 23 |
| Pluvios. | Jan. 20, 21, 22 |
| Ventos. | Feb. 19, 20, 21 |
| Germinal. | March 21, 22, 23 |
| Germ. | April 20, 21, 22 |
| Prairial. | May 20, 21, 22 |
| Messidor. | June 19, 20, 21 |
| Thermidor. | July 19, 20, 21 |
| Fructidor. | Aug. 19, 20, 21 |
| Jan. | Sept. 12, 11, 10 |
| Feb. | Oct. 13, 12, 11 |
| March | Nov. 21, 22, 23 |
| April | Dec. 21, 22, 23 |
| May | Jan. 20, 21, 22 |
| June | Feb. 19, 20, 21 |
| July | March 20, 21, 22 |
| Aug. | April 19, 20, 21 |
| Sept. | May 19, 20, 21 |
| Oct. | June 18, 19, 20 |
| Nov. | July 18, 19, 20 |
| Nov. | Aug. 17, 18, 19 |
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Besides these valuable papers, Captain Kater was the au-

thor of a large portion of the work entitled 'A Treatise on

Wave Machines,' containing one of the volumes of Dr. Lardner's

'Cyclopedia'—this volume being the joint production of

Lardner and Kater. In it is a chapter on the subject of pe-

ndulums constructed on the principle above mentioned; and it

may be observed that it was the first time in the literature of

dynamics that the relation of force to distance between the

knife-edges, Captain Kater employed a scale furnished with

powerful microscopes, to which one of a micrometer was adapted:

with this apparatus the 10,000th part of a second of arc was ac-

curately determined. In 1832 'An Account of the Construction

and Verification of certain Standards of Linear Measures for the

Russian Government,' 4to., London.

Captain Kater was a fellow of the Royal Society of Lon-

don, and in 1814 he received from the Emperor of Russia the

decoration of the Order of St. Anne. After a life spent in

philosophical research, he died in London, April 26, 1835,

leaving behind him many proofs of his zeal for the promotion

of physical science.

(From the papers in the Philosophical Transactions.)

KAUFMANN, MARIA ANGELICA, was born at

Chur in the Grisons, or Graubünden, in 1741 or 1742. Her

father, Joseph Kaufmann, was a portrait painter, of very or-

dinary ability; he, however, devoted unusual attention to the

education of his daughter, who displayed uncommon abilities

at an early age, both in music and painting. Though still

while young, to Milan, where they dwelt some time; and

in 1763 they visited Rome, and there Angelica attracted uni-

versal notice and admiration for her portraits, which were

excellently exhibited. She came to England in 1770, and

founded the first class of portrait painters. She was a

friendly relation of Anglica's, and frequently attended her

speeches in admiring terms of Angelica's accomplishments,

especially her facility in speaking the German, Italian, French,

and English languages.

In 1765 Angelica visited Venice, and in the same year,

in company, with Lady Wentworth, to England, where

she was received in a most flattering manner; she was elected

one of the original thirty-six members of the Royal Academy,

founded in 1768. She returned to Italy in 1782, having in

the previous year been married to Antonio Zocchi; she did

not, however, change her name, but was always known as

Angelica Kaufmann. She died at Rome in 1807, or accord-

ing to some accounts in 1808. She etched several plates, and

many of her own works have been engraved by Bartolozzi

and other eminent engravers. Angelica is said, previously to her

marriage with Zocchi, to have been cheated into a marriage

with an adventurer who gave himself out as a Swedish count:

as the story, however, though often repeated, does not appear

to be sufficiently authenticated, an allusion to it is sufficient.

The account of her which appeared in Huber's ' Manuel des

Artisans,' etc. was directly contradicted by Angelica herself, in an

Italian periodical in 1806; but the story of the impostor does not

occur in this notice.

Angelica, though not beautiful, had a very graceful person

and most agreeable countenance; she was by no means

complimented generally. To these attractions must be attributed

her success, for as a painter she did nothing of value beyond

an elegant female portrait, or an occasional female figure.

Her compositions are deficient in every essential quality of

art; in drawing she was extremely feeble, and her male and

female characters are not otherwise different than in costume.

(Goeze, Windhämml und sein Jahrhundert; Fiorillo, Geschichts der Zeichnen Kunst in Deutschland, etc.; Nagler, Künstler Lexicon.)

KEAN, EDMUND, was born about 1787, in London. His

father, Edmund Kean, seems to have been a stage-carpenter;

his mother was Miss Ann Carey, daughter of George Savage

Carey, and grand-daughter of Henry Carey. [CAREY, HENRY, P. C. S.] George Savage Carey, who was born in 1743 and died in 1807, supported himself by delivering public

lectures interspersed with recitatives, songs, etc. He was the

author of numerous songs and nine dramatic pieces. Miss

Carey was an actress at minor theatres and with strolling

players and in London at the Haymarket, etc. She died in

1821; two papers on the comparison of British Standards of

Linear Measures; one paper entitled 'An Account of Ex-

periments made with an Invariable Pendulum belonging to

the Royal Society of London; a third on 'On the Construc-

tion and Adjustment of the New Standards of Weights and

Measures in the United Kingdom of Great Britain and Ireland.'
got little literary instruction. His theatrical education, however, commenced early; Miss Tidwell instructed him in her art, and his mother, as soon as she found that he might be made useful, took him with her in her occasional occupation of selling flowers and perfumery from door to door, the beauty and tact, her countrywomen esteemed, of the mother; she afterwards took him with her in her rambles with strolling players and showmen. Master Carey, as he was then called, was so clever, that once, when Miss Carey and her mother were to be entertained by Mr. Richardson (the Richardson so well-known for his annual exhibitions at Bartholomew Fair), Master Carey was required to give his recitations before George III. at the Castle, which he did in a manner that so delighted His Majesty that he was presented with a handsome present. He continued his performances, sometimes with his mother and sometimes alone, at small places of public amusement in London and the neighbourhood till about the age of sixteen, when he left her entirely, and joined a company of strollers in Scotland.

Kean's first performance of a complete character was that of Young Norval, in 'Douglas,' in Richardson's booth; his first engagement with a regular company was in 1804, when he made his appearance at Sheerness on Easter Monday, on which occasion he played George Barnwell and Harlequin in a pantomime which was still called 'The Devil," and whose salary was 15s. a week. From this time till 1814, when he made his first appearance at Drury Lane Theatre, London, his life was a series of the vicissitudes, struggles, and privations incident to the life of a country actor in England; in 1808 he came acquainted with Miss Chambers, an actress in the same company in which he had obtained an engagement at Gloucester. Maria Chambers, in July, 1808, became the wife of Edmund Kean, as he then called himself; and when she was near her accouchement with her first child they travelled together from Bristol to Swanscombe, about one hundred and fifty miles, with only four pounds to pay their expenses on the road. On the 15th of September, 1809, Howard Kean was born. In the winter of the same year they passed over to Ireland, and at Waterford Kean became acquainted with Sheridan Knowles, then an obscure actor, or rather a denizen of the stage, who, under the name of Archibald L. Le, or the Gipsy, which was performed at the Waterford theatre, and in which Kean played the chief character with great effect, and the drama was eminently successful. It has never been printed, but an analysis and extracts are given in the 'Life of Kean.' Charles Kean, the second son, was born at Waterford in 1810 or 1811.

Kean had a high opinion of his own powers, and in his country engagements always stipulated for the privilege of playing the first characters, as they are technically called, declaring that he would 'play second to no man except John Kenble.' On two different occasions when the managers, again, offered him a character inferior to those with which he was familiar, he refused, and when Betty, the Young Roscius, he disappeared till after Master Betty had gone away. One of Kean's best engagements was at Exeter, where his salary was 2l. a week, for which he not only played Edmund Kean, as he then called himself, but in the 'Fairy Feller,' but Harlequin in the usual pantomime and the monkey in the 'Perouse.'

While Kean was residing at Exeter, in 1813, he engaged to play four nights at Teignmouth; having completed his engagement, he had a benefit, on which occasion he played Rolla in 'Pizarro,' and then there was 'Chiron and Achilles,' in which his son Howard performed, and lastly there was a pantomime, in which he exhibited his usual grace and agility as Harlequin. On this occasion Mr. Drury, late head master of Harrow School, happened to be present, with his wife. On the following morning Mrs. Drury called to pay for the tickets, and Kean was much struck with Mr. Kean's performances, and intended to speak to Mr. Pascoe Grenfell, one of the Drury Lane Committee, in his favour. In November, 1815, while playing to a very thin audience at Dorchester, he observed a gentleman in the box who was very attentive to his performance, and who seemed to admire it, but who did not applaud. Kean saw that he was appreciated, and played his best. The gentleman was Mr. Arnold, managing director of the Theatre Royal, Drury Lane. On a subsequent morning at Drury Lane, Mr. Arnold engaged him provisionally on behalf of the Committee of Drury Lane Theatre, for three years, at a salary of eight, with a week to play for each seven years. A short time before Kean was seen by Mr. Arnold, Mr. Elliston had offered him an engagement at St. a week to play at the Olympic Theatre, in Wych-street, London, but the engagement had never been completed, and Kean thought no more about it. When he came to London however, and Elliston heard that he was to be brought out at Drury Lane, he claimed his man, appealed to Mr. Arnold, and threatened to appeal to the law, the consequence of which was that Kean was not brought on till the 26th of January 1814, poor Kean and his wife and child were almost famished, not having received a shilling of salary, except 5l. which were sent to him at Dorchester to pay their expenses to London. At length, Mr. Arnold at Westminster, and the play-bills of Drury Lane announced 'The Merchant of Venice,' 'Shylock by Mr. Kean, from the Exeter Theatre,' which was received with great applause, though thinly attended, but the applause was tumultuous; he repeated the character; the house was well filled, and his fame was thereupon established. On his first night 164l. were paid at the door; on the second, 239l.; after which the average was upwards of 600l. His performance of Othello on one occasion brought 678l. 18s. 6d. After his third performance of Shylock, Mr. Whitbread invited him to breakfast to complete his engagement for three years, at 80l., and 102l. a character. Immediately after the contract was signed Mr. Whitbread tore it to pieces in Kean's presence, and presented him with a sketch of a new engagement, by which the Drury Lane Company made Kean 25l. a week for half the year. And 15l. per week. Not long afterwards the Committee made him a present of 600l., and he received many valuable presents from individuals. Drury Lane Theatre was saved from ruin by this engagement, which had been suggested by Mr. Elliston, and rapidly advanced to a state of unexampled prosperity.

Kean's career of success, including a visit to America in 1820, was uninterrupted till his criminal connection with the parties of Stow and the 'Smithfield,' and the subsequent attacks of the newspapers. On the 17th of January, 1825, the action of Cox v. Kean was tried, and a verdict of 800l. damages pronounced against him. Some of the newspapers made a series of comments very detrimental to Kean's character. The public were exasperated against him, and he was driven from the stage of Drury Lane and afterwards from that of Edinburgh. After some time however he was allowed to go on with his plays in London, and he again attempted to reestablish himself in his former position, and therefore gladly accepted an invitation to pay a second visit to America. After an absence of two seasons in the United States Kean returned to London, having during the time not only acquired but saved a considerable sum. The London public had relinquished their animosity, but it was in vain. He had always, in the time of his prosperity, been a dissolute man, but he had now fallen into habits of almost constant intoxication. His constitution was broken up, his memory was impaired to such a degree that he could not study a new part, his alacrity of spirit was gone, and his performances were little to the people's taste. Even the tone and accent by which he had separated from Mrs. Kean after the trial with Alderman Cox, and allowed her 200l. a year; his mother was alive in 1822, and had from him an allowance of 60l. a year. His eldest son was born, 1821, and entered Eton College, and when Kean found that he was disposed to become an actor, he absurdlly quarrelled with him, and abandoned him, and the young man was obliged to take to the stage in order to obtain the means of living. Charles Kean was a year or two in America; after his return his father became reconciled to him, and in 1833 it was announced that Kean would play Othello, at Covent Garden Theatre, and that Charles Kean would visit the United States. In 1835 Kean struggled through the part as far as the speech 'Villain, be sure,' when his head sunk on his son's shoulder: he was borne off the stage, and his acting was at an end: the audience in kindness immediately left the theatre.

Kean lingered on at his residence at Richmond for a while, and before he died wrote to his wife to ask her 'to forget and forgive.' She immediately came to him, and attended him till his death, which took place a few weeks after. In his last illness his hair grew long, and his voice was quite of the same strength as when he was a young man. He was always a kind man, but his character was as turbulent as his temper; he was somewhat harsh and given to expressing his supposed, trust to the impulse of his feelings. He studied his characters much and anxiously. Frequently, after his
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m and published in 1724 under the title of 'An Introduction to the true Astronomy, or Astronomical Lectures delivered at Oxford.'

In the 'Philosophical Transactions' for 1708 there are two papers by Keill. One is entitled 'A Discourse on the Cause of Attraction and other Physical Principles,' and the other, 'Of the Law of Centrifugal Force.' In the volume for 1713 there is a paper by him on 'The Newtonian Solution of the Problems of the Lunar Theory.' He also published 'Theoremata quaedam Infiniutim Materiar Divisibilissimae spectantia;' and one which is designated 'Observations on Mr. John Bernoulli's Remarks on the Inverse Problem of the Centrifugal Forces, with a comparison of the Derivations of the Fundamental Equations of both of these were published in 'te Transactions' for 1714.

Dr. Keill died Sept. 1, 1721, in the fiftieth year of his age.

A writer in the 'Acta Eruditorum' having, in a notice of Newton's Treatise on the Quadrature of Curves, stated that the English philosopher had taken the Method of Fluxions from Leibnitz, the indignation of Newton's friends was excited; and in the paper on the Law of Attraction, &c., which, as above mentioned, was published in the 'Philosophical Transactions,' Keill formally asserted the claims of Newton to priority in the discovery. This paper gave offence to Leibnitz, and in a letter to the Secretary of the Royal Society, required that Keill should be compelled to retract his assertion: this was not done; and Keill, in a letter to the Secretary, detailed the enormities of what he had stated. [Cammpanum Eptolenicu, P. C.]

Dr. Keill was not fortunate on another occasion. Entering into the war of problems which was at that time carried on by different schools of mathematicians, he took part on the side of Newton. On an occasion of an affair of the latter year, he somewhat presumptuously challenged John Bernoulli to determine the path of a body when projected in a medium which exercised on it a resistance varying with the square of the velocity: the challenge was accepted, and before Keill could complete his own solution, Bernoulli announced that he had succeeded in obtaining one: the former was, in consequence, compelled to endure in silence the reproach which a foreign mathematician did not fail, ungrudgingly, to administer.

An edition, in Latin, of Dr. Keill's principal works was published at Milan in 1742, in 4to., under the title 'Introductio ad veram Physicam et Astronomiam,' &c. From the 'Philosophical Transactions.'

Key Islands are a group of islands of considerable extent in the Indian Archipelago, situated between 5° 20' and 6° 30' S. lat., and between 132° 30' and 133° 40' E. long. Three islands are rather large, and called Great Key, Little Key, and Middle Key. The latter, however, is only a group of one is not known, as they are rarely visited by Europeans.

They rise to a moderate elevation above the sea, and all the heights are overgrown with forest-trees, which constitute one of the principal features of these islands. The aboriginals are engaged in ship-building to a considerable extent; a great number of country vessels that ply between Borneo and Timor on the east, and the coast of Papua on the west, are built on this island, especially on the island of Dhoula, which lies on the western coast of Little Key. These vessels are stoutly built, of excellent timber, and are sold for a moderate price.

There is no town at Dhoula, but the harbour is large and surrounded by numerous villages. The native population of the island of Banda obtain from this place an abundant supply of provisions, especially cattle. The European and Indian goods obtained by the traders are usually disposed of by the inhabitants to the Araro Islands [Sunda Island, vol. iii. p. 291] from the harbour of Elie, which lies on the eastern shores of Great Key. This place is also remarkable for the manufacture of earthenware, which is extensively prized by the inhabitants of all the neighbouring groups, and preferred to all other utensils of that description. Many of the inhabitants are occupied with fishing and trapping; and there has been a general reduction in the number of this fishery. Very little is known of the inhabitants of this group, except that a part of them have embraced the Islamic. This is especially stated of the inhabitants of Elie. It is further stated, that the population of Dhoula and of Elie and Ceram have settled among them, and perhaps it may be attributable to these foreigners that the native population has attained a higher degree of civilization than their neighbours.

F. C. S., No. 103.
They are stated to be more friendly to foreigners, and to be more honest in their dealings. (Kolff, Reise durch den weinig behenden südlichen Molukken Archipel.)

KILIAN was born at Augsburg in 1579, and was educated as an engraver by his stepfather Dominik Custos. He studied also the works of Tintoretto and Paul Veronese at Venice, after which he engraved several prints which were sold at Augsburg and obtained him the reputation of one of the best engravers of his age; his style of drawing was however not quite correct, and was somewhat mannered. He died at Augsburg in 1585. Locus had great command of the graver, and has been known to execute two portraits in a single week; his works are very numerous.

WOLFGANG KILIAN was born at Augsburg in 1581, was also instructed in engraving by his stepfather Custos, and, as his brother, studied also in Venice. In September there produced are the most carefully executed works of his. He was latterly compelled by the wants of a numerous family and hard times (it was during the Thirty YearsWar) to look more particularly the quality of his work, and his remarkably executed chief portraits. His greatest work is the Celebrities of the Westphalian Peace in Augsburg in 1649, in two sheets, after a picture by Sandrart; it contains about five hundred portraits, all finely executed.

BARTOLOMÆUS KILIAN, the third son of Wolfgang, was born at Augsburg in 1590, and was first instructed in engraving by his father, who afterwards by his son's request sent him to study with Matthias Merian, a celebrated engraver at Frankfurt on the Main. From Frankfurt Bartolomaeus went to Paris, where he remained a few years, maintaining himself by his own labour; and he returned to Augsburg in 1620, where he was very active in laying the ground work for the etching-trade. Sandrart terms him a born engraver: his works are very numerous, but are chiefly portraits. He died at Augsburg in 1690.

PHILIPP ANDREAS KILIAN, the son of Georg Kilian, closely related to the above, was born at Augsburg in 1714, and was taught engraving by G. M. Preiseler in Nürnberg. He studied also in the Netherlands and in various parts of Germany, and became one of the most distinguished artists of his time; besides his technical skill in the use of the graver he had a good taste and was a correct draftsman, but his execution was somewhat peculiar and monotonous. In 1744 Andreas engravings were sold in Poland and elsewhere, in which he is considered to have been a very fine artist, and he is considered to have been one of the most famous of his time. He was invited to reside in Dresden, but Kilian preferred his native city. He however visited Dresden in 1751 for the purpose of conducting the execution of his productions after the manner of the celebrated painter, the Dresden Gallery. Recueil d'Estampes après l'appareil plus célèbres Tableaux de la Galerie de Dresden. The completion of this collection was interrupted by the breaking out of the Seven Years' war, in 1756. Upon the cessation of this work he commenced an extensive series of illustrations of the Bible in quarto, which he accomplished by the assistance of various other artists, to the number of 130 prints, but they are not among his best works. He executed many portraits; two of the best of which are the emperor Francis I. and Maria Theresa, after G. von Mytens. Three days before his death he was engaged on a portrait of Pope Clement XIII., which he was very nearly completed. He died in 1759.

Heineken enumerates twenty-one members of this family, of whom eighteen were artists, and fourteen of these engravers. (Heineken, Ein Artikel von Künstlern und Künstleurs.) KILIGREW, THOMAS, a younger son of Sir Robert Killigrew, was born at Hanworth in Middlesex, in 1611. He travelled in his youth, was present at an exorcism of the nuns of Loudun, was appointed a page of honour to Charles I., and afterwards a secretary. After the fall of the court he was officiating one of the queen's maids of honour. His courage and licentious wit qualified him peculiarly for securing the favour of his master, who in spite of the remonstrances of his wiser counsellors, sent him to Paris, where he made his chief living by raising money for himself, and was expelled with disgrace. On the Restoration Killigrew became groom of the bedchamber, and enjoyed an intimacy and influence with the king which the first men in the nation were unable to obtain. He has sometimes been said to have been officially appointed to be the royal jester; but for this assertion there is no ground, for the king had no jester, but professional jesters would in any other reign have been allowed to take. He died at Whitehall in 1682. He wrote eleven plays, of which the first two were printed in 1641, and the whole collection in a folio volume in 1649. They do not by any means justify his reputation as a wit. A sufficient specimen of them is furnished by the comedy of 'The Parson's Wedding,' reprinted in Dodgson's 'Old Plays.' Killigrew's older brother, Sir Walter Killigrew, a spectable person, was the author of four or five plays, and of two volumes of moral reflections. He died in 1698. The youngest brother, Dr. Henry Killigrew, wrote a tragedy in his youth, took holy orders, and lived several performances. He was Master of the Savoy at his death, which took place after Sir William's. Dryden's fine elegy on Mrs. Anne Kilgrew celebrates a daughter of Dr. Henry.

KING, PETER, LORD, was born in 1669, at Exeter, in which town his father, Mr. Jerome King, carried on the business of a grocer and salter, though said to be descendend from a gentry family. In September, 1680, he bought up his son, and the future Lord Chancellor of Great Britain served for some years in his father's shop. It was probably his relationship to the celebrated John Locke, who at that time was living under the same roof, and by his father's help, that brought him into friendship with several of the leading men in the town, and brought him to notice of Lord Oxford, who was then compehended in the scheme of the national establishment. The Second Part, occupied with the Worship of the primitive church, followed soon after. This work excited much attention, and, besides a correspondence between Mr. Edward Elsy and the author, which was published in octavo, by the former, in 1694, drew forth, on its being reprinted in 1712, during the discussions on the Schism Bill, 'An Impeial View and Censure of the Mistrakes propounded for the obtaining power of Presbyters in a celebrated Book entitled An Enquiry, &c.' in an appendix to 'The Invalidity of the Disenting Ministry,' and also 'An Original Draught of the Constitution of the Presbyterian Church as an Enquiry,' &c., 8vo., Lond. 1717. Both these answers were professed to be 'by a Presbyter of the Church of England,' and the latter at least is known to be the production of a non-conformist. In the right hand of the book is the title-page pasted, and at the back of the book is the signature of the person who have been often reprinted after the work was published in 1703, in London, in 1714, a few months after the accession of George I., Sir Peter King was made Chief Justice of the Common Pleas; and he was sworn a privy counsellor in April of the following year. After the fall of the Duke of York, in 1668, he was, in June, 1725, appointed Lord Chancellor, and was at the same time raised to the peerage as Baron King of Ockham in the county of Surrey. Lord King however did not long retain this place, for in 1727 he Hastings, member for Hastings, in 1725, appointed Lord Chancellor, and was at the same time raised to the peerage as Baron King of Ockham in the county of Surrey.
fessional learning necessary for his new duties. He resigned the seals on the 28th of November, 1793, and died at his seat of Ockham on the 22nd of July, 1794. By his wife Anne, daughter of Richard Seys, of Boverton in Glamorgan-shire, Esq., he left four sons, who all inherited the title in succession, and from the youngest of whom the present peer (created in 1838) is descended. (Biographia Britannica.)

KING'S COLLEGE, CAMBRIDGE, was originally a school, a sector and twelve fellows, founded by King Henry VI. in 1441; but in 1443 he changed its form, and endowed it for a provost, seventy fellows and scholars, three chaplains, six clerks, sixteen choristers, and a music-master (with thirty-four servants to accommodate them); also twelve servitors for the senior fellows, and six poor scholars.

Eton College was founded by Henry VI. in 1441, and when he re-founded King's College in 1448 he placed it in immediate connection with Eton College for the supply of its scholars, each of whom at the end of three years from the day of his admission to King's College, is either elected a fellow or is no longer a member of the College. For the last twenty years the vacancies at King's College have been on an average less than four in the year. The process of electing the scholars on the foundation at Eton College for admission to King's College is described under Eton College, p. C.S.

The Society, as at present constituted, consists of a provost, a vice-provost, a dean of divinity, two deans of arts, three bursars, a tutor and classical lecturer, a morning reader, a divinity lecturer, a lecturer in mathematics, a conductor, and an organic scholar of art, and one of the unconditional grammarian.

A public examination takes place in the Hall of King's College at the end of Easter Term, when the students are divided into classes according to their respective degrees of precedence; and books, to the value of 10l. and stamped with the College arms, are apportioned to the three first scholars in the classical and mathematical examination; the three scholars who are highest in the divinity examination receive prizes of 10l. apiece, and portions from the yearly interest of 600l. left for that purpose.

There are also other annual prizes which have been specially provided for, either by the College or by bequests of individuals,—20l. to be equally divided between such scholars as have in the course of the year been most distinguished for learning and regularity of conduct; 6l. to such scholar or scholars as shall be adjudged to have deserved well by application to study and good conduct; 20l. prizes for Latin declamations; two 6l. prizes for English declamations: and one 6l. prize for the best translation of an English subject into Greek and Latin.

King's College has some peculiar privileges. The provost has absolute authority within the precincts; the undergraduates (under certain restrictions) are exempt, within the limits of their own college, from the influence ponderous of the Senate and other University officers; they keep no public exercises in the University schools, nor are in any way required to be examined by the University for their degree of B.A.

By the Gloucester Hall, the only colleges at which undergraduates can be elected fellows; in King's College, however, they are obliged to take the degrees both of B.A. and M.A. in the University when of sufficient standing, otherwise they are not entitled to the full proportion of their dividends.

There are thirty-six church livings in the patronage of the College,—two in Cambridge, two in Devonshire, one in Dorsetshire, one in Essex, four in Hampshire, two in Hertfordshire, one in Lancashire, two in Lincolnshire, one in Middlesex, five in Norfolk, one in Northamptonshire, six in Suffolk, five in Surrey, one in Sussex, one in Warwickshire, and two in Wiltshire.

The original buildings of King's College consisted of the present chapel and a quadrangular court to the north of it, built of stone, 120 feet in length by 90 feet in breadth. The building was commenced in 1446 and completed in 1468, when some parts had decayed, it was determined that a large quadrangle should be erected to the south of the chapel; Gibbs was appointed the architect. (Grene, Jams, P.C.) The building was commenced in 1527, and completed in 1610, when the quadrangle the Fellows' Building, or Grecian Building, as it is commonly called. Nothing more was done till July 12, 1824, when the new buildings were commenced by W. Wilkins, and completed by A. W. N. Pugin. (Wren, P.C.)

The quadrangle is 280 feet in length by 270 feet in breadth, and consists of the Hall, Library, Chapel, and apartments for the fellows and scholars. It is separated from Trumpington Street on the east by a screen, in the centre of which is the entrance-gateway bearing a domed tassel. The Hall, on the south side of the quadrangle, is 102 feet long, 36 feet wide, and 45 feet high, a noble room with a beautiful timber roof, similar to that of the Hall in London, the arches terminating in mantlets and adorned in early 15th and early 16th century work. There is a music-galley at each end, and an elegant screen at the west end. The roof is surmounted by two stone turrets, with minster-towers, and twelve fellows, founded by King Henry VI. in 1441; but in 1443 he changed its form, and endowed it for a provost, seventy fellows and scholars, three chaplains, six clerks, sixteen choristers, and a music-master (with thirty-four servants to accommodate them); also twelve servitors for the senior fellows, and six poor scholars.

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The first architect was Nicholas Cloos, and the first stone was laid in September, 1447. The walls were erected to a considerable height, but little progress was made during the latter part of the reign of King Henry VI. The building was continued during those of his successors, till in May, 1508, Henry VII. gave 5000l. towards the completion of the building, and his executors, in 1513, under a power conferred by his will, gave a further sum of 5000l. for the same purpose. In July, 1516, the exterior, including the roofs, was complete. In 1526 an agreement was made for the painted windows. The screen and stalls were not finished till about 1534.

This magnificent structure is, 316 feet in length, 84 feet in width, and 90 feet in height to the top of the battlements; the height to the top of each of the four corner turrets is 1463 feet. The interior length is 201 feet, the width 424 feet, and the height 78 feet. The exterior walls and the two roofs are supported by eleven vast buttresses on each side and four towers at the angles, and there are eight small chapels originally constructed for chantries, on each side between the buttresses. The exterior appearance of the chapel, with its towers and buttresses, lofty windows, pinnacles, and pierced battlements, is as beautiful as it is grand and imposing. In the interior the vast stone roof unsupported by pillared arches is one of the wonders of arcatectural skill. Eleven principal ribs spring from the buttresses on each side, forming an arch somewhat flattened at the centre, and which, in the whole, weigh a ton, hang as pendants, and appear to be the bones of the arches. The pendant are carved with alternate roses and pomegranates, the principal ribs are connected with each other and with the whole roof, forming a whole roof of the lightest and most richly carved fan-tracery, producing an effect of the strongest admiration and astonishment. It is stated that the stone pendants are not really key-stones, but might be safely taken away, together with the walls between the buttresses and the four towers, leaving, as it were, the skeleton of the building to support the roofs. The exterior roof, of light materials, is separated from the interior stone roof by a space of about six feet.

The great east window and twenty-four-side windows, each nearly 50 feet high, are filled with painted glass, and form a series of scriptural pictures of exceeding beauty. The great east window also contains plate glass, and stained glass, of national light. The whole of the interior, with its screen in the centre, its walls of carved stone, and its stalls and tabernacle-work of carved oak, is worthy of the highest admiration. (Lyons, Cambridge; Wason, Memorabilia Cantabrigia; Cambridge University Calendar, 1846; Cambridge Guide, 1857.)

KING'S COLLEGE, LONDON, an institution established in October, 1829, and incorporated by royal charter 14th August, 1830, as a college for the general education of youth, in which college, says the charter, 'the various branches of literature and science are taught, and also the doctrines and duties of Christianity, as the same are inculcated by the United Church of England and Ireland.'
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The charter precludes, in the following terms, persons who are not the Established Church from holding office in the college: 'Provided always, that no person who is not a member of the United Church of England and Ireland, as by law established, shall be competent to act as a governor by right of property, or to be elected governor, or be eligible as a member of the council, or to fill any office in the college, except only the Professors of Oriental Literature and Modern Languages.' King's College is not to be exclusive of the Church of England and institution; and in this respect only does it mainly differ from University College, London, which was established two or three years earlier, with the design of affording the advantages of a university to persons not excluded wholly or partially from the universities of Oxford and Cambridge, on account of their not being members of the Church of England. [UNIVERSITY COLLEGE, LONDON, P.C.] The visitor appointed by the charter is the Archbishop of Canterbury for the time being, and the governors, ex-officio, are the Lord Chancellor, the Archbishop of York, the Bishop of London, the Lord Chief Justice of the Queen's Bench, the Secretary of State for the Home Department, the Speaker of the House of Commons, the Lord Mayor of London, and the Deans of St. Paul's and Westminster. There are also life-governors, but their number is limited to eight. The council consists of the governors and the treasurer, and a number of others. The proprietors are those who hold shares or have been donors to the amount of 50£. Proprietors are entitled for each donation of 50£ or upwards, or for two years' residence, to nominate a student, either for general or medical education in the college, and one pupil in the school, or two pupils in the school. The chief officer of the college is the Principal.

The college was opened in 1831. There are five departments: the Department of General Literature and Science; the Department of Applied Sciences; the Medical Department; the Theological Department; and the School.

In the Department of General Literature and Science, matriculated students, not under the age of 16 (except in special cases), are admitted to a regular and prescribed course of general study, but are allowed to attend any particular lectures not prescribed in that course. Occasional students are admitted, who attend any particular course or courses of lectures given in the college. There are apartments fitted up in the college for a limited number of students not under eighteen years of age, who are required to dine in hall. The prescribed course of study comprises religious instruction according to the principles of the Established Church; the Greek and Latin classics; mathematics; English literature and history. The course of religious instruction is given by the Principal and the chaplain, and consists of lectures and weekly examinations. All matriculated students are entitled to sit for chapel daily, and a register of their attendance is kept. The academical year consists of the Michaelmas, Lent, and Easter Terms. Examinations take place at the end of the Michaelmas and Easter Terms. The students are required to pass examinations in order to proceed to the next year, and at the close of the academical year there is another examination, followed by a public distribution of prizes. After completing three years' course, those students who have passed through it with credit, and have also attended three extra courses of lectures, are entitled to the diploma of 'Associate of King's College.' There are Professors of Classical Literature, Mathematics, English Literature and Modern History, Natural Philosophy and Astronomy, Experimental Philosophy, English Law and Jurisprudence, Political Economy, Geology, Chemistry, Botany, Zoology, Fine Arts, Hebrew Language and Literature, Oriental Languages, and German. There is a Club to which German, Italian, and Spanish languages, respectively, and also of Vocal Music, are taught. The College of Surgeons and the Society of Apothecaries; and the Occasional Students attend only the lectures of parts of the principal. By King's College Hospital, some of the officers and all the dressers are selected from the pupils of the College.

The Theological Department was instituted in 1846, but has not yet been opened. In 1848, it is intended that students of King's College who shall have passed three years in the department of general literature and science, and who have received a diploma; for graduates of Oxford and Cambridge; and for all persons who shall be approved by the Principal and recommended by a bishop. The course of study will be for six terms (two years), and the fees will amount to 80£. It is intended to employ the students as district visitors, and to teach in the methods of conducting schools. They are also to be taught congregational singing. On the completion of the course of study the Principal is to be empowered to grant certificates of attainment and good conduct, which certificates are to be exhibited to the Bishop on application for holy orders.

There are libraries attached to the several departments, and also a general library.

The School Department is for youths from nine to sixteen years of age, and the course of instruction comprises Greek, Latin, French, mathematics, writing, arithmetic, book-keeping, history, geography, and English literature; and for the first three classes German. There are also extramural lessons. The terms are eighteen guineas annually, exclusive of books and stationery, with an entrance fee of one guinea. In 1845 the number of students and pupils was as follows:—

<table>
<thead>
<tr>
<th>Matriculated Students</th>
<th>Department of General Literature and Science</th>
<th>125</th>
</tr>
</thead>
<tbody>
<tr>
<td>Department of Applied Sciences</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>Medical Department</td>
<td>152</td>
<td></td>
</tr>
<tr>
<td>Occasional Students</td>
<td>307</td>
<td></td>
</tr>
<tr>
<td>In the various classes, exclusive of the Medical</td>
<td>35</td>
<td></td>
</tr>
<tr>
<td>In the Medical Classes</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Pupils</td>
<td>471</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>549</td>
<td></td>
</tr>
</tbody>
</table>

There are several small endowments by benefactors of the college. The Worsley endowment is for the instruction in every department of two scholars, to whom a stipend of 25£ is paid, and who, on the completion of their studies, are sent out as missionaries; and there are several others for prizes for proficiency and good conduct. These scholarships have been founded for matriculated medical students. The Master and Fellows of Magdalene College, Cambridge, have, on the death of Mr. Mead, given a sum of 5,000£, so that the sum of 5,000£. Mr. Marsden left to the College a valuable library of about 3,000 volumes, chiefly in Oriental literature and philology.

King's College forms the eastern wing of Somerset House, which was originally intended to give a part of that natural division which gives the name of the Strand, or the Queen's Walk, from the east of the Caspian Sea, between 35° and 45° N. lat., and between 45° and 59° E. long. Its political boundary is not distinctly determined, as it mostly runs through deserts, inhabited by nomadic tribes, which only nominally recognize the sovereignty of the Khans, and pay no obedience to his orders. Only on the east, the boundary between Khiva and Bokhara is more exactly fixed. It traverses the river Oxus a few miles north of Gurgaran; and so the students who are to be sent thence to the Caspian. The Caspian constitutes its western boundary. On the south of Khiva is the desert called Dushan Caves, and
through it lies the boundary-line separating Khyya from Persia and Merv. The authority of the Khan of Khyya may extend over a core 2000 feet above an level of the miles, or over 30,000 more than the extent of the British empire in Europe.

**Surface and Soil.**—We begin with the wide intakes which lie between the Caspian and the Sea of Aral. Between 44° and 45° N. lat., an extensive promontory projects into the Caspian. It is called Manoghalak, and consists of a mountain-block, divided into three chains, which according to an estimate made by the southern town of the country, is 44° N. lat. (north of 43°), a distance of about 150 miles. Its western boundary may be marked by a line drawn from the town of Khyya to that of Kana Oorgentagh, which falls short of a hundred miles. The mean distance of the two line does not exceed 30 miles, and the area of this tract falls short of 4000 square miles. It is not equal to double the extent of Norfolk. This tract is thinly inhabited, and produces almost every kind of grain in abundance. Its fertility is properly not derived from the soil, which, where it is beyond the reach of irrigation, consists of a hard loam, impregnated with salt, and nearly without vegetation. But the whole region is traversed by so many canals, that it resembles a net. The water is drawn from the Oxus, and runs with a perceptible current to the west and north-west, where the canals terminate in a series of lakes and a foot of sand-hills which divide Khyya Proper from the Desert of the Trachemene.

This description however applies only to the southern part of the region, or that which lies between 41° and 40° N. lat.; that which lies between 44° and 45° N. lat. is called the Desert of the Trachemene, which is entirely covered by the sand of its beds, contains very little land fit for agricultural purposes. It is annually inundated by the river, and mostly overgrown with reefs and rushes, but there are considerable tracts which serve as pasture-ground for cattle, which is of great importance, as the southern country has no meadow land or pastures.

On the sea of the river Oxus the cultivable ground is of small extent. About 42° 20' N. lat. begins a tract of higher ground about two miles from the river, which runs parallel to it for about forty miles to the south-east. This ridge is about four miles wide, and is called Sirkhodsholi; it rises about 600 feet above its base, and descends gradually eastward into the Desert of Kizil Cum. Where this ridge terminates (40° 35'), the cultivable land probably extends to five or six miles from the banks of the Oxus, and here also there are several smaller canals.

**River and Canals.**—The river Oxus, whose modern name is Amoo Deria or Ghion, originates in the elevated mountain region which divides Persia and Turkish Turkestan, and passes through Chinese and Persia, and which goes by the name of Bolor Toor. There it issues from a lake, called Sir-i-kol, which is about fourteen miles long from east to west, with an average breadth of one mile, and near 723 feet above the level of the Caspian sea. Sir-i-kol mentions the fact of its rising in a lake, which was supposed to be a bungalow, but while this lake was recently discovered by Lieutenant Wood. (OXUS, P. C.; TURKISTAN, P. C., p. 411.)

This lake is 15,600 feet above the sea-level, and on three sides bordered by hills, about 500 feet above its level, whilst along its southern bank they rise into mountains 3500 feet above the lake or 13,000 above the sea, and are covered with perpetual snow, from which never-dying source the lake is supplied. At Isar, about eighty miles from the place where the river leaves the lake, its surface is only 10,000 feet above the sea-level, and it continues to descend rapidly in traversing the mountain region, where it is called Panj. The mountains by which its course is enclosed, terminate at Kihl Chap, where the Oxus is joined by its first great tributary, the Kucha, or river of Badakshan. Immediately above and below this place the river is corridors in summer. Higher up it is less dependent on account of the rapidity of the current, nor lower down on account of the depth and the great volume of water, for in these parts it is joined by several large tributaries from the south and north, where it swells out into rivers from 300 to 400 yards wide, and runs about three miles and a half an hour. It certainly could be navigated in these parts, but it does not suppose such a purpose. The waters are led into several canals to irrigate the pastures of the region.
From Kiblah Chap its general course is to the west for about two hundred miles, through a country where cultivated tracts alternate with sandy deserts of moderate extent. After having passed the meridian of Balkh (6th ° E. long.), its course deviates westward, and, as a result of the current it continues to the boundary-line of Khyrva, watering the adjacent country for more than two hundred and fifty miles. The country which it traverses is unfit for cultivation, except in the immediate vicinity of the river, where the fields are irrigated from the river. It is here still a rapid stream and navigable, but not far from the boundary-line between Bokhara and Khvrva rapids are said to exist, which are full of rocks, and during low-water dangerous tides passed by boats. In this middle part of its course the Oxus is not joined by any permanent stream.

The lower course of the Oxus, from the above-mentioned rapids, above the Bokharan fortress of Charchui, to its mouth in the Sea of Aral, probably exceeds five hundred miles in length, so that its whole course amounts to nearly thirteen hundred miles. It therefore is larger than any river in Europe, except the Volga. Nearly two hundred miles of its lower course lie through a desert country, similar to that traversed by it in its middle course, but there does not occur any obstruction to navigation, and it is navigable. The river rises near 41° N., and traverses it in one bed as far north as 42° 30', or upwards of a hundred miles. It is turned by the northern extremity of Mount Shikhodshili to the west, and a few miles lower down the Tartar, and then two arms, of which the Lowdahn, continues to run in a western direction about fifty miles, when it falls into Lake Ak-Chegenank. This lake is situated near the base of the table-land of Oost-oort, and at a distance of two hundred miles from the Sea of Aral. It extends about thirty miles from east to west. On its northern side begins a deep depression, which extends along the base of the table-land to the Sea of Aral, and has a mean breadth of fifteen miles. It is entirely in water every winter, when the level of the Oxus is lowest, but only to a moderate depth. It is overgrown with reeds, rushes and other aquatic plants, with the exception of a comparatively narrow strip, which is surrounded by a broad, and whence the perceptible current runs to the Sea of Aral. The water of this swampy tract is sweet. Nearly halfway between the place where the Lowdahn branches off from the Oxus and its influx into Lake Ak-Chegenank, it sends off a branch to the south-west, which is called Szarkkran, and passes near the town of Kana (Old) Oorgondsh, but its farther course is not known. At Kana Oorgondsh it was, in September, 1842, a river about sixty or seventy feet wide, and two feet deep.

From the place where the Lowdahn branches off the main stream of the Oxus runs due north about ten or twelve miles, and then sends off an arm to the north-east, called Kook-shak, which extends about forty miles more than this branch, called Dunkara. From this lake a swampy depression similar to that of Lake Ak-Chegenank is stated to extend to the Aral; but this fact rests only on the information of the native, and is not confirmed by the observations of the Oxus again north-west, and sends a branch, called Kara-Beili, to Lake Dunkara, and two smaller ones, Kint Chargun and Koko-Daria, to the depression north of Lake Ak-Chegenank. Farther on, at a distance of about thirty miles, the Oxus divides itself into two arms, of which the smaller and western, called Takhly Daria, reaches the Sea of Aral without dividing any farther, but the eastern, Uria Daria, enters the sea by two arms, of which the eastern is known as Kankar Daria.

The Sea of Aral, into which the Oxus debouches, is a great inland lake. [AR AL.] It contains numerous islands, and some of them are inhabited and cultivated. The largest, called Tokmak-Ata, lies opposite the mouths of the Oxus, and is about twenty miles long. It is partly cultivated and partly overgrown with wood. The distance from the shore is about fourteen miles; and it is stated that when the water of the sea is low a man on horseback can pass through this strait, so shallow is it.

The Aral is not mentioned by the classical writers; were they unacquainted with this sea? or did it then consist of two parts? The moderns have maintained the latter opinion, and it has been asked, over which part of the isthmus lying between the two seas, the strait passed, which until that time had been the case direction of the Aral and inundated 46° 30', as in these parts the isthmus is occupied by the table-land of the Oost-oort, in which no depression of such a description occurs as would be required to form a wide and deep strait. The Russian surveys of the Caspian have made us acquainted with its eastern shores and the countries immediately adjacent to them. The hills which skirt the shores are, as already observed, interrupted at three places. But the two southern, and the northern, or the Tashkent, branch, has a distance from 300 to 400 miles from the southern shores of the Sea of Aral, and it is hardly probable that a strait of such a length could have passed through the country without leaving indelible traces; but such traces have not been found.

The northern depression above noticed, which opens into the Caspian, with the extensive lagoon of Kara Bogus, may have formed a strait, for its soil consists of such sand, as is left behind wherefore the sea water has not penetrated. It is also of considerable width, except towards the eastern extremity, west of Kana Oorgendsh, where it is only a few miles across. In these parts it appears rather to have formed the bed of a river than the receptacle of a strait. This leads us to another more complicated question. The ancient authors, who mention the Oxus, state that it flowed into the Caspian Sea, and the Arabic geographers of the middle ages, who were better acquainted with these countries than the ancients, hold the same opinion; it can therefore hardly be doubted that it was so. Arrian, whose authority is the best of all, distinctly states that it flowed into the Caspian Sea (Arab. 32). But where did the river which formed the Caspian Sea? It is certain that it did not flow into the Caspian Sea, when the Oxus had passed the Gulf of Khyrva, or Ashab Beyur, north of 39° N. lat., which is only one degree farther north than the place assigned to it by Arrian. It is probable that the Oxus did not flow into the Sea of Aral, but that it reached the sea by the middle opening, and flowed into Bukan Bay. But Alexander von Humboldt is of opinion that historical facts prove that, as late as A.D. 1500, the Oxus flowed into the Caspian Sea. The most decisive proof he finds in the ‘Theatrum Orbis Terrarum’ of Ortelius (1570), where an account and map of Russia and Tartary are found, which both previously (1562) had been published by Abraham Ortelius, agent of the Russia Company, who was sent to establish a commercial intercourse with central Asia by the way of the White Sea and Moskow. The title of Jenkin’s work is, ‘Rusiae, Mogolicae, Turciae, et Persiae Novissima, et accuratissima Descriptio.’

In this map the Oxus is laid down as falling into a large arm of the Caspian at 41° N. lat. This is evidently the lagoon of the Kara Bogus, but it appears that at the time of his travels (1559) the lagoon advanced much farther eastwards, which change may have been produced by a change in the level of the Caspian. In his account Jenkinson states that the water of the Oxus no longer reached the bay as it formerly did, and he attributes this change to the great volume of water which was drained from the river to irrigate the adjacent countries. But Oorgendsh was at this time a large country on the Oxus, with a large, and from what has been said, gable at that place. In fact, he embarked here, and ascended it to the vicinity of Bokhara. In the history of Abul Ghazi, it is stated that in 1575 the Oxus turned to the northward, and began to flow into the Oxus again north-west, and sends a branch, called Kara-Beili, to Lake Dunkara, and two smaller ones, Kint Chargun and Koko-Daria, to the depression north of Lake Ak-Chegenank. Farther on, at a distance of about thirty miles, the Oxus divides itself into two arms, of which the smaller and western, called Takhly Daria, reaches the Sea of Aral without dividing any farther, but the eastern, Uria Daria, enters the sea by two arms, of which the eastern is known as Kankar Daria.

A river like the Oxus, traversing such a level country as Khyrva, must be subject to frequent and great changes in its course. The river, like the Nile, brings down during the freshets a great quantity of detritus; but, unlike the deposit which the Nile leaves on the field at its mouth, the desert bed, the sandy matter contained in the waters of the Oxus diminishes the fertility of the soil. To prevent inundations the banks of the river and of the larger canals have been covered with sand. Above the level of 22° 30' the detritus is thus confined to their beds, and it leaves there a thick layer of mud mixed up with sand. The canals must annually be cleansed, and this is a laborious work. In spite of the enormous cost and the labor which has been necessary for this, the cultivation of the country surrounding Oorgendsh was then converted into a desert. Since that time this place has presented only ruins to the travelers who visited it; no river has been found in its vicinity in the last three centuries. But it would appear that in the last fifteen years the river has made some efforts to occupy its old bed. Several statements tend to prove it, and Bashiter found, in Sept. 1842, that the Szarkrak, near Kana Oorgendsh was from sixty to seventy feet wide, and two feet deep, and that the place, which was formerly uninhabited, had again been settled, and contained a population of 1000.
in this inundation. The level of the river is highest from May to July, and then its waters are very turbulent; but in the remainder of the year they are clear and well-tasted. It runs with a considerable current, at least two miles an hour. Its depth varies between six and ten feet. It must be much navigated, as it is stated that there are more than a thousand vessels employed in its transportation.

No country in the world has so many canals as Khvya. The number of the larger canals is stated to exceed twenty. In the southern districts they run westward to the beach; in the northern one, northward to the sea. They are connected with each other, and their length is considerable; that of Shwat, which is the largest, is at least seventy miles long. From these larger canals others of minor dimensions branch off and water the country to the distance of twenty miles. The canal of Palwan has twelve such lateral canals, of which one-fourth exceed twenty miles in length and about six are more than fifteen miles long. The water of these canals is brought to the fields by ditches. During the fresher a considerable current runs through the canals, and even at other seasons it is perceptible. The canals are still more navigable than the Oxus itself.

Climate.—The climate partakes of that excess of cold and heat which is not uncommon in the climate of large deserts. Though the thermometer does not rise much above freezing, the temperature is not sea-level in January. The summer is long, and in May is very hot. The winter is short, and the thermometer does not fall below freezing. It is a dry climate, and the summers are dry; rains fall rarely, but gales are frequent. Frost is common in October, and frequent in the spring. The temperature of the air is low in the south, and high in the north. The climate is a little too dry for the cultivation of the vine, but it is warm enough for it.

Production.—Agriculture is attended to with great care and industry; sometimes the fields are ploughed seven times. Great attention is paid to the preparation of manure. The crops are rice, wheat, barley, millet, sesame, cotton, jute, hemp, and clover; in the gardens, melons and water-melons, pumpkins, carrots, turnips, peas, onions, potatoes, and cucumbers; in the orchards, mulberries for rearing the silk-worm, apricots, apples, pears, plums, cherries, and vine, also currants. The fruits are not distinguished by flavour, except the melons and water-melons. On the banks of the canals and ditches are fruits of the most delicious kind; the melons and water-melons are only found on the eastern banks of the Oxus. In the lower region a plant grows wild, whose roots, moricha, are used in dyeing.

The horses of the Truchmenes are very beautiful, and held in great estimation, especially those which are called argamaks. Common horses are brought to Khvya by the Kirghiz. Many camels are kept, even by the poorer people, and also asses. Few cattle are reared, on account of the want of meadows, except by the Karakalpakes, who import cows and oxen into the cultivated region. Sheep are reared by the Truchmenes, or imported from Bokhara, on account of the fleece of the Kirghiz import a considerable number for slaughtering. Fowls are numerous; but turkeys, geese, and ducks, are only kept by the khan. Water-fowl are numerous in the delta, but not in the desert. Of wild animals there is little to be seen; bears, wolves, foxes, wild cats, jackals, hares, wild goats, deer, and wild hogs, mostly in the delta, where also the tiger is sometimes met with. Fish abound in the lakes, river, and Sea of Aral. Bears and wolves do not abound. Turtles and crayfish abound. Silk-worms are reared to a considerable extent.

Gold and copper are said to exist in the Shikhodshili mountains; but they are not worked. Of the woods there are stone for building, lime, pine, cypress, salt, and sulphur.

Population and Inhabitants.—The whole population is estimated at 2,000,000, of which one-fourth are stated to be sword-armed. Of the whole, about 125 persons live on a square mile, which does not appear to be an over-estimate, as there are several places containing some thousands of inhabitants. This region is inhabited by two nations—the Uzbecks and the Sartes. The former are a branch of the Turks, whose language they speak, and are the ruling nation. They have abandoned the nomadic life and live in houses, and in summer frequently to tents erected on the fields which they cultivate. Many families of these inhabitants inhabit the towns of Khvya, where their language, and occupy themselves with the cultivation of the soil, commerce, and handicraft trades. They are a very peaceable and industrious people. Among these nations a few families of Jews, Armenians, Afghans, Aimaiks, Kirghis, and Karakalpakes are settled; the last three have been import- as slaves.

The uncultivated portion of the Khatan is in possession of three nomadic tribes—the Truchmenes, Karakalpakes, and Kirghis. All three are Turkish nations, and speak dialects of the Turkish language. The Turkomenes (Truchmenes) or Turcomans, wander about in the wide region lying between Khvya Proper and the Caspian, and extending from the southern boundary of the table-land of Oost-aort to the mountains of Kasaan and of the Aimaks. They live on the great steppes, and are very peaceable and industrious. They are skilled in the arts of the camp, and live by rearing sheep and cattle. They are very firm in their faith, and build their khan. The Kirghis, who call themselves Kasaks, wander about in that immense plain which extends from the banks of the Volga to Lake Balkash. Some of their tribes living in the vicinity of the Karakalpakes appear to be in some degree dependent on the Khan of Khvya, but we do not know if that dependence is real or only nominal. They have numerous herds of horses and sheep, of which they annually im- port a great number into Khvya.

Towns and Villages.—It is observed as a very remarkable circumstance, that in no part of Central and Western Asia, except in Khvya, the country lying between two towns or large villages is interspersed with a great number of small farming establishments, which are situated in the centre of the lands belonging to them. This proves that the inhabitants must enjoy a considerable degree of security. The number of towns containing more than 1000 persons is rather great in proportion to the extent and population of the country.

Khvya, the capital and residence of the khan, consists of about 700 mud houses, but the suburbs contain 1500, and the population exceeds 12,000 individuals. The streets are crooked, and so narrow that a loaded camel cannot pass through them. The palace of the khan is only a large mud building. There are two colleges and three mosques, all built of brick. The karwanas are also of brick and arched over.

The other large towns are Nogorocht, Gurulan, Mura, and Kiptshak, in the vicinity of the Oxus, and Shawat and Taishathau in the interior of Khvya Proper. The town of Kungrad may be considered the capital of the nomadic popula- tion of the delta. In summer it has very few inhabitants, but in winter it is the common residence of several nomadic tribes that inhabit the adjacent country. Its walls are stated to be more than twelve miles in circuit.

The Manufactures of Khvya. The manufactures of Khvya are inferior to those of Bokhara, but still of some importance. The chief are those of cotton, of which several kinds of stuffs are made by the Sartes, who also work up all the raw silk made in the district. Other manufactures are the weaving of cloth and other articles of wool are made by the nomadic nations. In some places are large manufactories of earthen- ware. Several utensils of copper are made in the town of Khvya, but all the best copper imports, almost exclusively from Russia; only a few Kirghis settled in the khanate exercise the trade of blacksmiths.
Commerce. — In a country like Khryva, whose soil supplies its inhabitants abundantly with food, whilst its manufactures afford almost all the other necessaries of life, but do not yield any article for exportation, foreign commerce must be very inconsiderable. The most active is that with Bokhara, from which place also a few Indian goods are imported. We have heard of commerce with the distant and the Pacific. From time to time a caravan goes from Khryva to Orenburg. It exports a few manufactured articles, sheep-skins, hides, and horses, and brings back utensils, coffee, tea, and some woollen or silk goods. It passes through Kana Oorganeth, traverses the table-land of Oost-oort, near the shores of the Sea of Aral, and after descending to the low plain its route lies through the Little Horde of the Orenburg. The commerce between Khryva and Persia is still less important. Khryva sends there chiefly horses, and receives in return dried fruits and some silk goods.

History. — Khryva probably was a part of Bactria when that country was united to the sway of Cyrus, the founder of the Persian empire, and constituted a portion of the province of Bactria at the time of the conquests of Alexander the Great. After his death it was united to the kingdom of Syria, but separated from it by the revolt of Theodotus of Bactria (256 before Christ), who founded a separate kingdom in these parts. But in the second century before Christ the nomadic nation of the Khwarias began to ascend into Turan, to take possession of the countries north of the Oxus and south of the Sea of Aral. They seem to have laid waste the country and kept possession of it for more than two centuries. In the second century after Christ however, Bactria was reduced under the sway of the Chinese emperors, who at that period extended their dominions to the shores of the Caspian. It is not known at what time and in what way the Chinese were compelled to abandon this country. In the third century of our era it was connected with Persia, and remained so up to the tenth century, when one of its governors acquired independence and erected the kingdom of Karizim or Khowarism, which appears to have remained independent and independent state until it was conquered by Gengis Khan (1218). The descendants of Gengis Khan remained in possession of the country, which continued to form an independent kingdom under the name of Khowarism, up to 1797, when the town was taken by Tiourk, and the country annexed to his possessions. Khryva remained a part of Mawar-el-nahr, or the kingdom of Samarkand, to the beginning of the sixteenth century, when a Turkish nation, the Usbecks, under the auspices of Shibli Khan, descended from Upper Turkistan, and by degrees took possession of the whole of Turan. Khryva, as it appears, soon became an independent state under an Usbeck prince, and has remained so to this day. A few years ago it was discovered that the caravans passing between Orenburg and Bokhara, in travelling to the country east of the Sea of Aral, were frequently molested and robbed by the subjects of the Khan of Khryva, who knew that they were unable to restrain the nomadic nations from attacking the caravans, they resolved on taking possession of the country; probably also with the view of extending further their conquests in this direction; however, the government of the Emperor of China,ributed to the order of Charles, the Emperor of Russia, who was then in the neighborhood of Orenburg, and who employed none of his time on other pursuits unknown to his father. He was about fifteen when, during a public examination of the pupils of the college in Berlin where he received his instruction, he was asked: 'Why, you know nothing at all.' He replied indignantly, 'Because you cannot, or you are not taught to learn anything.' He was, therefore, sent to the university of Marburg, and afterwards to the imperial university of Khryva; he was there instructed in foreign languages, history, and the arts of war, and was appointed governor of a province in the north of Persia, where he died in 1756.
bled from place to place without finding repose for his pursuits. During the time he was in Paris, Klaproth distinguished men in the French armies, and his name became known to Napoleon. Klaproth's admiration for the French emperor must have been great, for after Napoleon had become Emperor, Klaproth, with Baron Vyse, the fallen hero in his exile. Napoleon received him very well, and it appears that Klaproth, expecting the emperor's early return to France, offered him his services, and was chosen as one of the first newspapers in France. The 'hundred days' however passed away without any notice being taken of Klaproth, and when the Bourbons returned to Paris he was at Florence, in rather uncomfortable circumstances. He was imprisoned at the Leghorn, and when the Bourbons invited him to settle in Paris, and there Klaproth live some time by his pen, when he accidentally met with William von Humboldt, who, although he had seen him only once, employed all his influence to procure for him a situation suitable to his pursuits and his merits. It was at Humboldt's recommendation that the late King of Prussia, Frederick William I., conferred upon Klaproth the honorary title of royal professor of Oriental languages and literature, which was accompanied with a liberal pension, and a promise to defray the expenses of printing whatever works the professor might think fit to publish. Klaproth was further allowed to stay in Paris as long as pleased France, and all wars and moreover enjoying an income which enabled him to gratify his love of pleasure and refined society, Klaproth now exhibited an extraordinary activity, and it was in the years succeeding his return from Paris that the most remarkable productions which established his European reputation. The life which Klaproth led in Paris, leaving his study only to plunge into the heart of the most medical and physical excitement of Paris, and the payset capital of Europe, preserved faithful to his health. In 1833 the symptoms of a drop of the chest becoming alarming, a tour to Berlin, where he was received with great distinction by the king and the public, produced a good effect; but shortly after his return to Paris the symptoms became worse, and his bodily sufferings were unfortunately accompanied by occasional derangement of his intellectual faculties. The skill of the French doctors however was more than equal to their task, and after long and painful sufferings Klaproth died suddenly, on the 27th of August, 1835, and was buried in the cemetery of Montmartre.

Klaproth was one of the best scholars and decidedly the best linguist of his age which can justly boast of great linguists. His penetration and sagacity, the quickness of his perception, were extraordinary; clearness and perspicuity distinguished his style; and his memory was so happy and capable of retaining the most difficult impressions without ever confounding them, that he seldom made more than scanty extracts. When he began a work, it was already clear and distinct in his mind, and the composition did not take him more than ten days, provided he was not interrupted by a visit to the Louvre. When we compare Klaproth with William von Humboldt, we find that Klaproth had the superiority in analytical power, while Humboldt surpassed Klaproth in the synthetic. Klaproth's books are laboriously designed, and after long and naturally of a kind disposition towards everybody. Yet this 'man was the dread both of his literary enemies and friends. The former dreaded his answers to their attacks, and the latter observed the greatest precaution in their intercourse with him, lest they should irritate his irascible temper; and it would seem as if he made no distinction between scientific and moral error, so severely did he handle those who incurred his scorn through a degree of inaccuracy or ignorance in matters of learning. His controversy with Professor Schmidt, the Mongol scholar in St. Petersburg, is an instance of this.

It would take much space to give a complete catalogue of his numerous publications, especially as the majority of them consist of pamphlets, memoirs, and dissertations, many of which are not of great importance. Previous to 1812 he had only published minor works, as for instance, 'In- schrift des Œuf, übersetzt und erklärt,' Halle, 1811, 4to., being a German translation, with notes, of a Chinese inscription: an Euphrates stone. Amschel von Hirsch's 'Asiatisches Magazin' was edited by himself. The following are his most remarkable works.

1. 'Reise in den Kaukasus,' with maps, Halle and Berlin, 1816, 12mo., being a description of the various languages and national characters; and a collection of Russian, French translation, with valuable additions, appeared in Paris in 1823: 2. 'Exécution d'Autome (The Autumnal Excursion), Peking, 30ème année Kia King, 8ème lune, jour mal-
speaksthe state of knowledge of his time. 18, Notice
d'une Mappemonde et d'une Cosmographie Chinoises, pub-
lies en Chine, l'une en 1730, l'autre en 1732, Paris, 1833,
-cr. ; 19, 'Npon o Dai itai ouan, ou Annales des Empereurs
du Japon, de M. le Dr Wv, revu et corrigé, revu et corrigé,
original par M. Klapproth, et précédé d'une Histoire My-
thologique du Japon,' Paris, 1834, 4to.
Among the publications edited or translated by Klapproth,
we mention the six volumes of the Asiatique Society of
Paris, of which he was one of the founders; Guldénstädts's
Travels in the Caucasus; Count John Potocki's Travels in
the steppes of Astrakan and the Caucasus; Father Della
Penna's description of Tibet; a description of the same coun-
try, translated from the Tibetan language into Russian, and
thence into French; Timokowski's Travels to Pekin; "Magazi-
zn Asiatique," from 1825-27, &c. &c. Among his minor pro-
ductions a letter to Baron Alexander von Humboldt on the
invention of the Compass, and another on the art of printing
and gunpowder, are both important and interesting. Klapproth's
contributions to the learned periodicals of France, Germany,
and Russia would fill more than twenty octavo volumes. Kl-
approth was not only an Oriental scholar, but also an excellent
theoretical as well as practical geographer, as appears from
Critical Observations on Arrowmith's Map of Asia; his
"Géographie d'après les Missions," published by
le l'Empereur Kiang-Loang, par les Missionnaires de Pekin,;
Paris, 1835, in four large sheets: "Carte de la Mongolie,
de la Russie, de la Corée, et du Japon," Paris, 1833;
and his monographies on the "Mekong," "Pechla," Klapproth
left ready for the press 'Description géographique,
statistique, et historique de l'Empire Chinois," which was
to appear in French and English, but has not yet been published.
The same year, he published a MS, containing a plan of an
church of Mithridates," and a Commentary on Marco Polo: both
these works were completed in his mind, but as he was not
in the habit of making many notes previous to writing, there is
not a single MS ever made ready for pub-
A complete catalogue of all his publications is con-
tained in Catalogue de la Bibliothèque de feu M. de Klapproth,
universitaires, Paris, 1835, crto. (Bibliothèque Universitaire; 
Notice du Neolog de Deutschen;
Quädrat, La France littéraire.)
KLEBER, JEAN BAPTISTE, according to the best au-
thorities, was born at Strasbourg in the year 1754, though some
place the date of his birth three or four years earlier. He
was brought up by his father, who was a domestic in the house-
hold of the Cardinal De Rohan, to the profession of a
wealth in his behalf, induced him to accompany them to
Munich, and through his influence he entered the military
career. This new situation filled him with pride and
science of war gained him the patronage of General Kaunitz,
son of the celebrated Austrian minister of that name, by
whom, at the completion of his college career, he was
appointed to a post of some importance in an Austrian
regiment. He
served seven years in that corps, which he left in 1783, in
order to return to his native country. He there resumed his
former profession, and obtained the situation of inspector of
public buildings at Béthor in Upper Alsat.

The breaking out of the French Revolution opened to him
a more brilliant career. He had taken a prominent part in a
revolt at Béthor in 1791, and had enabled the republicans of
that town, by putting himself at their head, successfully to
resist the regiment of Royal Louis, which had been called to
suppress it. To screen himself from the consequences of this
act of rebellion, he joined a private soldier in the
corps of the battalion of volunteers which had been raised in
the department of the Upper Rhine. By his bravery and
talents he soon attained the rank of adjutant-major, in which
capacity he was soon taken notice of. When
Custine was afterwards brought to trial, he had the
courage to present himself before his sanguinary judges, and
give testimony in his favour. At the siege of Mayence in 1792, considered one of the

services were rewarded by the rank of adjutant-general, and
shortly afterwards he became brigadier-general. From thence
he was ordered to La Vendée to oppose the insurgent royal-
ists, who, conducted by M. de Bassette, King of the Rooks of
the Vendéens, and assisted by a community of the clergy of
Mount Cenis, whose courage and devotion he could reckon. At the cele-
brate combat of Toulou (September 19, 1793), while charging
the army at the head of the advanced guard of his regiment,
he fell with several wounds, and his life was only preserved
by the prompt assistance of his soldiers. The agents of the
National Convention construed into a crime his humane inter-
ference in stopping the cruelties which were exercised towards
the prisoners. After the termination of this affair, he was cres-
ated. However he was only removed to a command in the Army
of the North, and afterwards in that of the Sambre and Meuse,
where he held a general of a rank of division.

At the battle of Fleurus (June 26, 1794) he commanded
the left wing of the French army, and by his skilful ma-
noeuvres greatly contributed to the victory. He then marched
against Mons, which he took from the Austrians, and having
forced the passage of the Scarpe, he advanced again to the
right bank of the Rhine. Returning towards Maasstricht,
he took that strong fortress, after a siege of twenty-eight days.
In 1795 he directed the passage across the Rhine of
the army of the Sambre and Meuse, and, when compelled to
retire before superior forces, he effected a retreat in which
his cool intrepidity and skilful dispositions were alike remark-
able. In the year following he put to the glory which
attended the success of General Jourdan's operations at the
opening of the campaign; and he afterwards refused the com-
mand of Pichegru's army, when this general was disgraced
by holding his troops to inaction.

(From "Lexique historique de l'Europe moderne," by Paul de Puy.
C. J.)

Discontented with the manner in which the Directory
managed the military affairs, Kléber retired to Paris, where he
spent the greater part of the year 1797, and occupied him-
self with the military affairs. His wish to command
was not satisfied, as he was appointed to the chief command of the army for Egypt;
he made it a special request to the Directory to be allowed
to take him as one of his generals of division. Kléber joyfully
accepted the appointment, and the plan of an army for Egypt,
brilliant achievements already prognosticated his future glory.
The army likewise which he accompanied was in a great measure composed of the veteran soldiers, who had distin-
guished themselves in the war of 1793-94. After so many

At the siege of Alexandria, on the first landing of
the French forces, he was wounded in the head while gallantly
climbing the ramparts, but he did not retire from the conflict
but he was carried to hospital a second and a severe wound. While in
hospital he was taken Kléber was appointed to the command of it,
and of the whole province of which it was the head-quarters. He
afterwards joined his division and took part in the expedi-
tion to Syria; there he distinguished himself by the cap-
cature of the fort of El Arish and Gaza, and was at the taking
of Jaffa. He was also at the memorable siege of St. John of
Acre, where he rendered himself conspicuous by his un-
daunted bravery, and shared every danger with the common
soldiers. He was however withdrawn from the siege by order of
Bonaparte, who desired him to march with his division to
reinforce the troops stationed at Nazareth under the command
of General Mathews, and to repel the attack of the
remnants of the Mamelukes under Ibrahim Bey, the
Janissaries of Aleppo and Damascus, and numerous hordes of
irregular cavalry, who were advancing upon their rear, and
were bid to storm the walls of Acre. The arrival of Kléber's divi-
sion was most opportune, for the enemy had already crossed
the Jordan, and were rapidly pressing in considerable numbers
towards the coast. Kléber left Nazareth with the entire
distraction of his troops in order to make an attack upon the
Turkish camp, but in attempting to do so he was anticipated by
the enemy, who advanced against him with fifteen thousand cavalry
and as many infantry. Kléber formed his small army of two
thousand men in squares, and placed the artillery at the
angles, which had scarcely been effected when he was
fiercely attacked by the whole force of the enemy's horse.
A deadly fire from the close range which the
remnants of the Mamelukes and
the Janissaries poured in upon the
Turkish troops. The siege of Acre however was renewed
in vain, every assault against it proved unsuccessful, and
British valor, combined with Asiatic enthusiasm, was finally
triumphantly repelled. (From "Lexique historique de l'Europe
modernes" by Puy.
C. J.)

The French on their return to Egypt obtained at Aboukir
another signal victory over the Turks; and the day after this
decisive battle Bonaparte returned to Alexandria, where he
was greeted by the cheering crowds; and Count de Cuyerea, the
close blockade of Malta by the same powers. These
circumstances, combined with the loss of his fleet at the
battle of the Nile, determined him upon leaving Egypt.
On the 22nd of August, 1799, he secretly embarked, accompanied by several of his generals, his secretary Bourrienne, with Berthollet and Monge, who had joined the expedition for the furtherance of science. Before leaving he signed his orders for Kléber by adding his name. He had appointed him his successor in the chief command of the Egyptian army, and authorized him to conclude a convention for the evacuation of the country in the event of no succour arriving. At the same time he wrote to Napoléon of the great mortality from the plague amongst his soldiers should amount to fifteen hundred men.

The sudden departure of Bonaparte spread anxiety and distress in the camp; the reputation of his successor however, who enjoyed the highest confidence of the army, tended greatly to dissipate their fears. But the talents of Kléber did not at first appear to be equal to the difficult circumstances in which he was placed. He not only permitted himself to be swayed by feelings of indignation at what he deemed the abandonment of the army by his former chief, but he committed the fault, which in his position became a crime, of openly declaring his opinions to his disconsolate colleagues in command; he thus caused the seeds of discontent and desire of home, which had been previously sown among the troops, to ripen to a maturity which soon threatened the ruin of the expedition. A letter addressed by him to the Directory contains many erroneous and exaggerated statements which had been furnished by Pousseeilgue the army administrator, relative to his own and public affairs in Egypt. A copy of it is in the Memoirs dictated by Napoléon at St. Helena to the Count de Montholon, and is rendered more valuable on account of the copious comments which are prefixed thereto, that is, the analyses of the French spirit, are for the most part borne out by contemporary testimony.

In this letter Kléber complains that his army is reduced to one-half; that it is destitute of the necessary stores and munitions, and that the greatest discontent prevails. He further states that the Manœuvres were dispersed but not destroyed, and that the Grand Vizir was marching from Acre to the head of thirty thousand men. Two copies of this letter were sent, one of which fell into the hands of the English who was the immediate cause of the expedition under Sir Ralph Abercromby, by which the French were compelled to abandon Egypt. In justice however to Kléber it must be mentioned that his chief fault consisted in trusting too implicitly to the statements which had been given to him by one who, though loaded with favours from Bonaparte, made this ungrateful return to his absent benefactor in order to secure his present interests.

Kléber, under the influence of these despondent feelings, addressed proposals of accommodation to the Grand Vizir; though at the same time he made vigorous preparations to repulse an attack. This proceeded the necessity of a negotiation. The Grand Vizir with upwards of forty thousand men had crossed the desert, and, assisted by some British officers, had captured the fort of El Arish on the 29th of January, 1800. The English Government at Desmaiz was, against his will and contrary to his judgment, appointed negotiator on the part of the French, and, after many debates and frequent delays, a convention was signed at El Arish on the 29th of January, 1800, by which it was agreed that the whole of Kléber's army should return to Europe, with its arms and baggage, either on board their own vessels or some furnished by the Turks; that all the fortresses of Egypt, with the exception of Alexandria, Rosetta, and Aboukir, should be surrendered within forty-five days from the time that the convention was ratified; and finally, that the Vizir should pay a sum equivalent to about 30,000,000 francs, during the evacuation was taking place. The English admiral, Sir Sidney Smith, though not vested with full authority from his government to conclude such a convention, had entered willingly into it, as it was hoped would precluding see it carried into effect. Three months however before those events the British government had dispatched orders to Lord Keith, who had the command of the Mediterranean arm of the allied convention. It was not stipulated that the French army should be considered prisoners of war; and a letter from this admiral reached General Kléber, warning him of his intention to detain any vessel returning to Europe. The Convention was signed under the name of the French commander made a noble use of the opportunity which was now presented to him of retrieving his military character. Danger reviver his energies and roused his courage. He immediately ordered the evacuation of the stronghold to be stopped, and prepared to resume hostilities. In one of those acting proclamations so common in modern French warfare, he indignantly declared to his soldiers that victory was the only answer to such insolence, and bade them be ready to fight. This appeal to their courage was entirely with the shouts of the army. On the night of the 10th of March, 1800, Kléber formed his army, which was 12,000 strong, into four squares, with the artillery at the angles, and the cavalry in the rear. The main body was formed and commanded by General Regnier, and those on the right by General Friant; the whole army was drawn up on the plain fronting the ruins of Heliopolis. Before them were the Ottoman army, advancing towards it in their rear was Cairo with its three hundred thousand inhabitants, waiting only the signal of success to join the standard of their faith. The formation of the French had taken place by moonlight; perfect order and deep silence prevailed throughout the ranks, and every soldier felt that the fate of Kléber and of Egypt hung on the issue of the contest. A large body of Turkish troops had encamped in the villages of Matarieh, and a movement was made by the division of Regnier to cut it off before the remainder of the army could come up to its support. No sooner did the Janizaries perceive the approach of the hostile columns than, rallying forth from their entrenchments, they attacked them with desperate courage. Steadily onwards however moved the unbroken bands, pouring forth a rolling fire. They drove the enemy back to their camp, while their cavalry charged the squares of the Turkish cavalry soon enveloped the compact squares by whose murderous fire they fell so rapidly that a barrier of bodies was formed around them, and impeded the renewed attacks of the impetuous horsemen. But Astile value could not long withstand European discipline, and the Turks at last fell in confusion towards the desert. Kléber, following up his success, hastened to El Karah, where was posted the enemy's army, were according themselves closely pressed, hastily retired, leaving behind them the whole of their baggage and munitions. Thus ended the battle of Heliopolis, important in its results, and attended by little loss to the French, who numbered only two or three hundred killed and wounded. The relief of Cairo, in whose citadel two thousand men under General Verdiere were closely besieged, was the next object. The firing had scarcely ceased in the plains of Heliopolis when the sound of cannon was heard from Cairo; it informed Kléber that fresh exactions were required, and he instantly proceeded to the rescue of his countrymen. The Turks under Ibrahim Bey, who formed the besieging army, were hanging on the verge of a serious battle, to evacuate the town; but the excited populace of Cairo refused to listen to any terms, and prepared themselves for a desperate resistance. It became necessary to take by storm Boulah, and the energies of the French, which had returned from the pursuit of the Grand Vizir, invested the city. On a further refusal to surrender, a severe cannonade was directed against it, and it was finally entered by assault. A desperate struggle ensued between the besieged, who occupied the houses, and the besiegers, who pressed on in the streets. Night alone terminated the contest; and, on the following morning the Turks offered to capitulate, and were permitted to do so on favourable terms. Kléber, in this instance, as in many others, enhanced his victory by his moderation and humanity.

About the time that these events were taking place, another body of the Turkish army had laid down their arms to General Belliard; and Mourad Bey, the chief of the Manœuvres, deputed of every hope of ultimate success, concluded an honourable convention with the English that the Turks had returned within a month of the battle of Heliopolis, the French were again in possession of their previous conquests. With an army trudging in numbers, with a numerous enemy in his front, more than half completed by death, and his courage were so greatly renowned, with all Egypt revolted in his rear, and when the English considered that he would be compelled to surrender on any conditions, in less than forty days he had overridden the Ottoman emperors, and completely dispersed the revolted Egyptians. A graphic description of the Turkish mode of warfare is to be found in the eighth volume of Alison's 'History of Europe,' to which valuable work we have been much indebted for the details of this narrative.
Released from immediate danger, Kléber now began to direct his energies to more pacific labors, and to apply them to the administration of the conquered country. His plan appears to have been that of first asserting the position of the victorious army, and to adopt the course followed by the British government in India of enlisting in its service the native troops. Scarcely however had he entered on this work when he was involved in an expedition to Egypt. A young Turk, a native of Aleppo, named Suleiman, was incited to the atrocious act by religious fanaticism and the prospect of an ample reward. He had performed the pilgrimage of Mecca and Mezireh, and his mind was deeply impressed with the tenets of the Musalmans' faith. He cherished the idea of being in Palestine, when the remaining remnant of the vizier's army was passing through that country, and he became acquainted with Kléber, who was then at Jericho, at whose suggestion he was sent to become the instrument of what he considered divine vengeance on 'the sultan of the French.' He was furnished with a sum of money, with which he proceeded to Cairo, and spent several weeks in seclusion in a mosque of that city. He had intimated his purpose to the four principal sheikhs of the mosque, who, though they attempted to dissuade him from it, took no steps to prevent its execution. He armed himself with a poniard, and having followed Kléber several days without being able to effect his purpose, he at length determined upon concealing himself in an abandoned cistern in the garden attached to the mansion which the general occupied. On the evening of the 29th of June, 1798, Kléber was passing with Protais, the architect of the army, and he was pointing out to him some repairs which the building required, when Suleiman presented himself before him as a supplicant for alms; who, referring to his function, was seized with the opportunity of rapidly striking him several times with his dagger. The architect, who was armed with a stick, attempting to interfere, received a severe though not deadly wound. The guards having hastened at the cry of Kléber, secured the assassin, whom they found concealed behind some ruins. Universal sorrow spread through the army, and the Arabs themselves, who had frequently admired and experienced his clement disposition, regretted his fall. A military commission was immediately assembled to try the assassin, boldly confessed, and even gloated in his crime. The four sheikhs, the partake of his confidence, were beheaded, and Suleiman was impaled alive.

Thus prematurely perished this distinguished general, and with him the hopes of the eastern expedition. He had formed many important designs for colonizing the country, and it is probable that, under his judicious rule, it might long have been preserved a valuable acquisition to the French Republic. 'There is no military man,' says Napoleon, 'who will deny that the army of Acrebrouck would have been detested if Kléber had lived. How many times was the weight of a young fanatic, acting on the faith of a doubtful passage of the Koran, in the general balance of the world?' Though many may hesitate to agree with this assertion, it is certain that the name of Kléber was strongly contrasted with that of his successor General Menou, to whom by seniority devolved the chief command of the expedition. In a conversation with Dr. O'Meara, Napoleon further remarks that, of all his generals, Desaix and Kléber possessed the greatest talents. There was also a melancholy coincidence in their deaths: on the same day, and nearly at the same hour, that Kléber fell under the stroke of an assassin in Egypt, Desaix, who had left that country about three months previously, found a glorious death on the plains of Marengo.

Kléber,' says a celebrated French writer, 'was the finest man in this revolution. His lofty stature, his noble countenance, whose features were animated by the fire of his soul, his valour at once bold and calm, his prompt and sure intelligence, rendered him on the field of battle the most commanding of commanders. His talents, though unaided by education, were brilliant and original. The works of Plutarch and Quintus Curtius were his constant and exclusive study; he sought in them that nurture of lofty minds which the active and warlike soldiers of the Republic had been deprived of. All the glories of his conduct were capricious, indolent, and capricious. It has been said of him, with truth, that he was as unwilling to command as to obey. He obeyed indeed under General Bonaparte, but it was as an obedient man, he could not bear another's name, as in the campaign with General Jourdan; it was in the midst of combat that, by a species of inspiration, he assumed the command, and exercised it with mastery...
Newton’s experiment on which it was founded, were impugned by Klingenstaerna, who, from his own experiments, found that although most grains had a golden-yellow color, under the circumstances in which Newton supposed it would be wholly free from it. In 1744 he transmitted to the Royal Society an account of his experiments, together with some investigations on the dispersion of light in lenses, and these papers induced that distinguished artist to have again recourse to experiments with a view of determining more accurately the nature of the refractive power of lenses. It was in the prosecution of these experiments that Dollond discovered that combination of lenses of flint and crown glass by which the dispersions of light have been so nearly corrected in optical instruments. He was a fellow of the Royal Society of London in 1730; and in the ‘Philosophical Transactions’ for 1731 there is a paper by him on the quadrature of hyperbolic curves.

Klingenstaerna died Oct. 28, 1785; and by order of the crown, the mother of his pupil Gustavus III., he was buried in the tomb of Dalin, who had died a short time before him.

KNAPPA, a genus of plants belonging to the natural order Gramineae. It has an influence, with a somewhat one-sided raceme. The flowers solitary; glumes not keeled, and blunt. It has 2 pale, when dry, very sly; one obtuse, unequal, and without awns. There is but one species of Knapia.

K. amplexicaulis, an elegant but very small grass, with a small tuft, containing, having numerous stems and short polygon leaves. The spikes are slender, consisting of from 5 to 10 mostly sessile alternate spicules. It is found in sandy maritime pastures, but is rare in grass.

Knauth (author님의 독감, a German botanist), a genus of plants belonging to the natural order Dips-aescaceae. The inner calyx is cup-shaped, with radiant teeth, the outer one forming a thickened margin: the germs. It has 4-fld corymb, a fruit with 4 sides and 8 little depressions, the receptacle with spinous scales shorter than the involucre.

K. arenaria, the Field Scabious, has its lower leaves simple, the stem-leaves pinnatid, the inner calyx with 8 or 16 somewhat awned teeth. The stem rises from 2 to 3 feet in height, it is 1 or 2, the flowers few, the petals are purple, in large, convoluted long-stalked heads. This is the only British species of this genus. There are a few species of Knautia natives of Europe.

Knibb, Rev. William. Of the early life of this devoted missionary few particulars have yet been made public, but the very brief interval which has elapsed between his unexpected death and the time of writing this article (January, 1846) is sufficient to account for the lack of such biographical information. From a sketch of his life and character in the ‘Patriot’ newspaper of December 22, 1844, to which we are mainly indebted for the materials of this notice, it would appear that he was born at Kettering in Northamptonshire (a place, it may be remarked, early connected with the history of the Baptist Church, P. C. p. 270), about the commencement of the present century. In due time he was apprenticed to a printer at Bristol, where he appears to have made an early profession of religion. His early inclinations were gratified by his admission into the Baptist Church in 1823, when he undertook the charge of a school connected with one of the Baptist Mission churches in Jamaica, where he died, in May, 1824. The intelligence of his death so excited the zeal of Mr. Knibb, the late London Missionary Society agent for the island, that he at once visited the scene of his death. He was present at the inquest, and, as one who was well acquainted with him, he was enabled to furnish much that was valuable.

In the autumn of 1834 Mr. Knibb returned to Jamaica, and in the following summer he was invited to undertake the charge of a school connected with one of the Baptist Mission churches in Jamaica, where he died, in May, 1824. The intelligence of his death so excited the zeal of Mr. Knibb, the late London Missionary Society agent for the island, that he at once visited the scene of his death. He was present at the inquest, and, as one who was well acquainted with him, he was enabled to furnish much that was valuable.

1835. The death of Mr. Knibb, another missionary of the same denomination, he accepted a prearranged invitation to succeed him as pastor of the mission church at Falmouth. He then removed to the island of St. John, of between eight and nine hundred members. Shortly after Mr. Knibb’s settlement at Falmouth he was brought into painful notoriety in consequence of the breaking out of an alarming spirit of abolitionism, which had been communicated to him by various letters, and by the influence of that spirit, which had been embodied in an anti-slavery petition, had been actually sent to the West Indies, but had been suppressed or held back through the influence of the slave-owners; and, in consequence of this belief, the slaves upon several estates in Jamaica avowed, towards the latter end of December, 1831, their determination to do no work after Christmas. So soon as the missionaries became acquainted with this state of things, they endeavoured to remove the erroneous impression from the minds of such of the negroes as were under their influence, and were so active in their measures as to lead to a report among the disaffected slaves that the white people had bribed Mr. Blyth (a Presbyterian missionary) and Mr. Knibb to withhold their freedom. In surreptitious movements were, in spite of all the efforts of the missionaries, actually commenced by the negroes, although the interposition of Mr. Knibb, who possessed great influence over the slaves, saved them for several of his mission and dispersed them to their respective plantations. Notwithstanding this fact both he and his brother missionaries were regarded with great jealousy by the planters, overseers, and others in the slave-holding interest, whose enmity had been excited by their efforts for delaying the conclusion of the negroes, and by the part they had taken in exposing many cases of gross cruelty and oppression. On the 1st of January, 1832, Mr. Knibb was compelled, without regard to his sacred mission, to leave the island, and while on shore he was arrested and with marked indignity. Having a few days later, memorialized the governor for exemption from military service, he was arrested, and debarred from any communication with his family, upon the plea of alarming intelligence by which it was pretended, the missionaries were implicated in the rebellion. After suffering much persecution, he was released in February, no evidence being obtained to support a criminal prosecution; but in March fresh steps were taken to bring him to trial, though on the day appointed for trial the proceedings were abandoned upon the appearance of about three hundred witnesses who came forward, upon a few hours' notice, in his defence.

During the continuance of disturbances in the island Mr. Knibb’s chapel and mission premises at Falmouth were razed to the ground by the negroes, under the direction of a certain regiment, who had used them as barracks for a time; and as similar outrages had been committed on other missionary stations, it was determined that Mr. Knibb, accompanied by Mr. Burchell, should visit the English Colony and present the grievances and demands of the mission. They accordingly reached England in the beginning of June. Down to that time the Baptist Missionary Society had carefully avoided taking any part in the question of emancipation, regarding it as one of the political questions on which it was desirable to observe a rigid neutrality. Mr. Knibb was accordingly cautioned not to commit the Society by his proceedings; but, warmed with enthusiasm to the highest pitch by his personal knowledge of the horrors of the system, he boldly declared that the Society’s missionary stations in Jamaica could no longer exist without the entire and immediate abolition of slavery, and, feeling that the time had now arrived for making that declaration at the annual meeting of the Society on the 31st of June, to avow this at the risk of his connexion with the Society. Mr. Knibb carried the meeting, and subsequently the feeling of the meeting was so strong in favor of the agitation on this subject, that his stirring appeals had no unimportant share in bringing about the Emancipation Act of 1833.

In the autumn of 1834 Mr. Knibb returned to Jamaica, and in the following summer he was again invited to undertake the charge of a school connected with one of the Baptist Mission churches at Falmouth, and of a new Lancaster school for children of all denominations at Trelawney, was commenced under his superintendence. The same benevolence and energy which had led Mr. Knibb to the western district, induced him now to expose the failure of the apprenticeship system established by the act of 1833, as
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a means of preventing the evils anticipated from sudden emancipation. He showed that many of the worst features of slavery were continued under the guise of apprenticeship, and indirectly to anticipate to some extent a law by immediate emancipation. After the complete emancipation of the slaves or apprentices, on the 1st of August, 1838, Mr. Knibb purchased, by the aid of English friends, a tract of ground for the purpose of founding an independent and occupa-
tion for the liberated negroes; and he erected a normal school at the village of Kettering, in Trelawny, for training native and other schoolmistresses for both Jamaica and Africa. As a consequence of the missionary work of the Church of England in Jamaica, and the mission churches in Jamaica, it was determined by the missionaries to separate themselves from the Baptist Missionary Society, so far as any dependence upon them was concerned. Church was constituted in the same year Mr. Knibb visited England to promote the establish-
ment of a theological seminary in connexion with the native mission to Africa, which had been commenced about two years before, through his exertions. In the early part of 1845 he again visited England, to obtain pecuniary aid for the negroes connected with the Baptist churches in Jamaica, who, in a new way, made the victims of cruel oppres-
sion, in consequence of the adoption, by the colonial legis-
lature, of a system of taxation which bore upon the liberated negro labourers with extreme severity, by limiting the supply of food and other necessaries, and at the same time importing, by the revenue from the sale of emancipated negroes, a large number of European and foreign labourers, so as to overstock the labour-market, and reduce the persecuted negroes to the greatest distress. Hav-
ing succeeded in obtaining both sympathy and pecuniary assistance for his objects, he returned to Jamaica. In the fall of the same year he was seized with yellow fever, and died, after an illness of only four days, on the 16th of that month, at the village of Kettering. Though his funeral took place on the following day, much was not respected by the friends of the memory that not less than eight thousand persons are said to have assembled on the occasion.

It is yet, perhaps, too soon to form, between the enthusiastic passport of his friends and admirers, and the bitter vituperations of his political opponents, and of the men whose opposition he expressed with such unflinching courage, an accurate estimate of the character of William Knibb. Of a peculiarly ardent temperament, and feeling that he had under-
taken the championship of a cause which demanded all the zeal and energy which could be called into exercise for the exposure of enormous wrongs, he sometimes exceeded, in the estimation of his best friends, the bounds of prudence, if not of charity; but it should never be forgotten that his long resi-
dence in Jamaica, and his intimate knowledge of the state of the country, enabled him to furnish an intimate but real, if not to be realized by his friends in this country, the cruelties which he laboured to abolish or to mitigate. As an instru-
ment in the mental and moral elevation of the negro character, the negro will long be honored in the African race. A full account of the important transac-
tions in which he was involved is given in the second volume of Dr. Cox's 'History of the Baptist Missionary Society.'

KNOLE, MARTIN VON, a distinguished German painter of the eighteenth century, was born in the village of Steinhach in the Tyrol, in 1725. His father appears to have been a poor painter of some sort, and he intended his son to follow his own pursuit. He was however in such circum-
stances as to make it necessary for his son to perform the menial work of the house, which Martin appears to have found particularly distasteful. The boy accordingly ran away from home, and took shelter in the house of a rath von Harnay, at Innsbruck, who, when he had heard the boy's story, let his father know of his safety, and placed him with an ordinary painter of the name of Pögel, who thus became Martin's master, and who have had the slightest influence upon him, if any at all. Martin's father however required his son's services in every way, and he was forced to return home, where he divided his time be-
tween the requirements of his art, in which he was very skilful, and other way he could, and in the performance of menial domestic offices. Such was the state of affairs when circumstances brought the painter Paul Troger, on his return to Viechtach, where Martin, with some of the extraordinary productions of Knoller, then twenty years of age, Troger perceived the lad's ability, and offered to take him with him to Vienna. Young Knoller went with his patron, and in eight years from that time he had not a superior of his own age in the Austrian dominions. Already, in the years 1748-50, he assisted Troger in the frescoes of the cathedral church of Britzen; and in 1750 he obtained the important position of pupil for the church of St. Stephen, in Vienna. In 1753 Knoller returned to the Tyrol, and in the following year painted in fresco the church of Annas in such much in the manner of Troger that it might pass for the work of that master. In 1754 he was engaged in the restoration of the design and sharp in his outline. In 1756 Knoller visited Rome, and greatly improved his style during the three years he spent in that city. From Rome he was invited to Naples, and was engaged in painting the Church of the Illustrious, where he employed him much in that city, and in the decoration of his palace at Milan. Knoller visited Rome several times subse-
sequently, and contracted a close friendship with Winckelmann, and with his death he was considerably impoverished. In 1760 he left Italy, and returned to Vienna, where he continued to paint in frescoes, the frescoes of the church of Volders near Hall, in the Tyrol, consisting of passages from the life of San Carlo Borromeo. In 1765 he returned to Milan to his former patron, Count Firmian, whose esteem and patronage induced Knoller to make Milan his head-quarters, and he there mar-
ried, in 1767, the daughter of a merchant, by whom he had nine children. Knoller painted many works in Milan, in oil and in fresco, the best of which is a ceiling in the palace of the Prince Belgioioso, representing the apotheosis of one of his ancestors. The palace of the Count Firmian was rich in Knoller's works. His principal German works are the fres-
coes of the church of Our Lady in Wilten, near Innsbruck, and the seven cupolas of the church of Neresheim in Wur-
temberg, painted in 1770-75, for which he received 23,000 florins. He painted a large fresco, 110 feet by 33, in the chapel of Maria-Turin, near Turin, for which he received 2,000 Vir-
gin; and there are altar-pieces by him in several churches in the south of Bavaria. He was much engaged also at Vienna, but chiefly in portrait painting; be was there ennobled, with the title of normannia, and there are many of his works in the Tyrol, at Innsbruck, Bozen, and other places. The church of his native place, Steinhach, possesses three altar-pieces by Knoller. He died in 1804. He was gay in colouring, accurate and vigorous in design, and his works are chiefly characterised for their physical qualities—dramatic and effective composition, strong expression, and vigorous and uncommon attitude. His sphere was almost exclusively the practical part of art; the true historical and aesthetical he hardly approached; but this might be said of many more emi-
nent painters. A Life of Knoller was published in the ' Bei-
träge zur Geschichte und Statistik der Tyrol,' for 1881.

(Lipowsky, Künstler-Lexicon; Fitoilo, Geschichte, &c.; Nagler, Künstler-Lexicon.)

K. NOULTONIA, a genus of plants belonging to the nat-
ural order Leguminosae, family of Caesalpinieae. The
petals, with the margins nacked. The stamens and ovaries numerous; many 1-seeded succulent fruits, not pointed by the style, which is deciduous. The species are 1-seeded peren-
niel herbs, the flowers are pointed, with the fruit 3-angled and flat-
dowered. The leaves are used as vestiaca in the Cape of Good Hope. There are four other species, native of the Cape of Good Hope, where these plants grow in abun-
dance. They will thrive well in a mixture of loam and peat,
and may be increased either by dividing the root or by seed.

(Dow, Gardener's Dictionary; Lindley, Flora Medicinali.

KNOX, REV. VICEMISUS, D.D., was born at New
instant of the Rev. Mr. Knoller, LL.B., Fellow of St. John's College, Oxford, and head master of Merchant Taylors' School, Lon-
non. Vicemisus Knox, the son, was also educated at St. John's; and was made head master of the school at the time of his settling at Tunbridge, and his wife died in 1809, leaving two sons and a daughter. A short time after his marriage he received the degree of D.D. by diploma from the University of Cambridge. He was the second head master of Tunbridge School thirty-three years, he retired, and was succeeded by his eldest son. He was rector of Rumwell and Ramsden Crays, in Essex, and minister of the chapelry of Shipbourne, in Kent. He performed the duties of a parish
priest nearly forty years with great regularity. In the latter part of his life he resided in London. He was much admired as a preacher, and frequently gave his aid in behalf of public charities by delivering a sermon. He died while on a visit to his son in Cambridge, Sept. 6, 1871.

Dr. Knox's chief works were—1, 'Essays, Moral and Literary,' 12mo., 1777, which came out anonymously, and met with so much success that he republished them in 1778, with additions. 2, 'Liberal Education, or a Practical Treatise on the Methods of acquiring Useful and Polite Learning,' 8vo., 1781, enlarged in 1785 to 2 vols. 8vo. This work was chiefly intended as a recommendation of the principles of the English universities, and is said to have had some effect in producing a reformation 3, 'Elegant Extracts in Prose,' 8vo. 4, 'Winter Evenings, or Laccubrations on Life and Letters,' 3 vols. 12mo., 1784. 5, 'Elegant Extracts in Verse,' 1790, 8vo. 6, 'Sermons intended to promote Faith, Hope, and Charity,' 1792, 8vo. 7, 'Elegant Epistles,' 8vo., 1792. 8, 'Family Lectures,' 8vo., 1794. 9, 'Christian Philosophy, or an Attempt to display the Evidence and Excellence of Revealed Religion,' 2 vols. 12mo., 1795. 10, 'Considerations on the Nature and Efficacy of the Lord's Supper,' 12mo., 1799.

Dr. Knox published a few other minor works, occasional sermons, and poems.

Dr. Knox's writings were once much admired. His style has considerable neatness and elegance, but he has little originality or power of thought, and his popularity has for some years been on the decline. The 'Elegant Extracts' were made with much taste and judgement. They were very useful works in their day, and had for many years a large circulation.

(Dr. Knox's 'Poems and Obituary, 1822; Watt's 'Bibliotheca Britannica.')

KOEBELL, the name of several German and Dutch landscape painters, of whom the following are the most distinguished.

Ferdinand Koebel was born at Mannheim in 1740, and was educated by his father with a view to obtaining an honourable position in the civil service of the Electoral government. He had long meditated on becoming a lawyer or a diplomat, or even a lawyer or a diplomat, or even a archaeologist, or a landscape painter. Ferdinand however had an invincible passion for landscape-painting, which the encouragement of the emperor Prince Karl Theodor, enabled him finally to follow, notwithstanding the opposition of his father. He studied eighteen months at Paris, in 1768-70, at the expense of the elector, who appointed him his cabinet painter after his return to Mannheim; he was also made a member of and secretary to the Academy of Mannheim. In 1793 he removed to Munich, where he died in 1796. Koebel was also a very able etcher: a set of his prints, 'The Battle of the Carnival at Mannheim,' from drawings by Count Seckendorf, is a beautiful example of Koebel's style. His etchings have been published by the Kunstblatt, and are among the most important of his productions. In his Dictionary. Koebel's landscapes are well selected, true in colouring, and executed with care: the figures in them are painted by himself.

Ferdinand Koebel, the younger brother of Ferdinand, was born at Mannheim in 1748. He was intended for a merchant, and spent four years in a merchant's house at Mainz; but his love for the arts, especially landscape and architecture, finally overruled all obstacles, and his brother's patron, the great collector, Theodor, befriended him also, and enabled him, in 1776, to visit Italy, where he remained an enthusiastic student of Italian painting, chiefly at Rome, for nine years. From Rome he passed to Florence, and then to feel the invigorating influence of the landscapes of Academia and Seckendorf, and then to learn from the landscapes of Theodor and Seckendorf, and then to become a landscape painter, and then to be appointed a member of the Academy. Koebel's landscapes are well selected, true in colouring, and executed with care: the figures in them are painted by himself.

KOELE, a genus of plants belonging to the natural order Gramineae. It has unequal glumes, the upper one with 2 or 3 ribs, shorter than the compressed. The outer pales is narrow, rough at the edges, and ciliate. In dry places the leaves are much shorter than the stem; in damp places elongated, as long as the leaves. (Babington, 'Manual of British Botany.')

KOELE/RIA, a genus of plants belonging to the natural order Gramineae. It has unequal glumes, the upper one with 2 or 3 ribs, shorter than the compressed. The outer pales is narrow, rough at the edges, and ciliate. In dry places the leaves are much shorter than the stem; in damp places elongated, as long as the leaves. (Babington, 'Manual of British Botany.')

KONIGA, a genus of plants belonging to the natural order Cruciferae. It has an oval compressed poutch, from 1 to 2 seeds in each cell, simple filaments, and 8 hypogynous glands. But one British species of this genus has been described, K. maritima, which is a procumbent plant, with bipartite hairs, lanceolate acute leaves, oval pointed glabrous pods. It is the Lobularia of Koch, and the Gyco of Lindley. The flowers are white and scent-scented.

KOTTBUS, [COTTBUS, P.C.] KRAFFT, an old sculptor and architect of Nürnberg, where he was born about 1430; he married in 1470. There are several of his performances still extant in the city and churches of Nürnberg, but the principal is the huge figure of St. Lawrence, which is one of the columns of the church of St. Lawrence, Lorenskirche. It is in the form of a square open Shakespearean spire, and is 64 feet high, the pinnacle being turned downwards, like the points of a crenel; and the whole design is the work of the church. The ciborium is placed immediately upon a low platform which is supported partly by the columns of Adam Kraft and his assistants, and partly by a wall, or 12 feet of the platform itself is hollowed, and ornamented with the figures of eight saints. The whole tabernacle is also profusely ornamented with small figures in the round and basque-reliefs: immediately above the ciborium, on three sides, are representa-
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tations in boso relicue of Christ taking leave of his Mother, the Last Supper, and Christ on the Mount of Olives; high above them is Christ before Caiphas, the Crowning with Thorns and the Scourging; above those are the Crucifixion and, lastly, above that is the Resurrection, all in the round. This elaborate work was executed by Kraft for a citizen of the town of Han, executed on a raft, but so strenuous was the task that both of are still involved in their former uncertainty. He is supposed to have died in the Hospital of Schwabach in 1507. Sandrart has inserted the portrait of Kraft in his 'Academy,' from a work referred to above, unless he had been in a tabernacle. (Sandrart, 'Deutsche Academie,' &c.; Doppelmayr, 'Historische Nachricht von den Nurnbergerischen Künstlern,' &c.; Fuseli, 'Allgemeines Künstler-Lexicon,' Nagler, 'Allgemeines Künstler-Lexicon.')

KÜGELGEN, GERHARD and CARL VON, twin brothers and distinguished painters, were born at Bacharach on the Rhine, in 1772. Their father was Hof-Kammerrat, exchequer-counselor, in the service of the elector of Cologne, who in 1721 sent the twins to complete their studies in Rome after they had made sufficient progress at home. Gerhard painted history and portrait; and Carl, landscape. Gerhard was induced to try his fortune at St. Petersburg, whither he was sent by his brother, who was already resident there, and broke through both with great success, and married two sisters, of a noble family of Curland; but Gerhard, after a few years, removed in 1804 to Dresden; Carl remained at St. Petersburg, where he was appointed professor of painting and architecture, and where he had established himself, and a high reputation, at Dresden, where he held the appointment of professor of painting at the Academy, where his career was suddenly cut off in a most melancholy manner. He was brutally murdered and murdered on the road from Pillnitz to Dresden, not far from the capital, in 1820. It was a common highway robbery; the miserable wretch who committed the deed was not in the least aware of who his victim was. He was a painter of singular dignity, and the cause of his detection. He even drew off the boots of Kugelgen, and his afterwards taking these boots to be mended to the very man who had made them and who knew them, is said to have been the cause of his detection. Kugelgen's works are of a very undignifying character; in most of them an abstract religious sentiment is the chief and characteristic motive; in execution they are careful, delicate, and somewhat formal, yet pleasing and impressive. He delighted in compositions of one or at most very few figures; often three-quarter lengths of the size of life. His biography, by E. F. Griesbach, was published in Leipzig in 1845.

Carl Kugelgen painted many landscapes, and executed many drawings of the scenery of Russia, both in the northern and southern provinces. He made two journeys in the Crimea for the purpose of making etchings. One of these journeys was made in 1804 by the desire of the Emperor Paul, the second by the express permission of the Emperor Alexander, in 1806. Thirty of paintings and sixty sepia drawings, part of the fruits of the second journey, were purchased by the emperor, and placed together in a hall in Kamouo Ostrov. In 1818 Alexander sent Kugelgen for a similar purpose into Finland, of which country he painted fifty-five pictures, which also were purchased by the emperor. Kugelgen executed in all 171 pictures and 200 finished drawings. He died at Beval in 1832. His Life is in the 'Neser Nekrolog der Deutschen,' &c.' 1 (Nagler, 'Allgemeines Künstler-Lexicon.')

KUPETZKY, JOHANN, a very celebrated portrait painter, was born at Böding or Bonn, near Pragreb in Hungary, in 1867 or 1868. His father, originally of a Bohemian family, was a poor weaver, and he intended his son to follow his own business; Kupetzky however had very different intentions: he fled from home when only fifteen years of age, begged his way to Switzerland, and there, at Lucerne, obtained the name of Hans Imhof, and for some time with great success painted the portraits of the name of Klaus, who instructed him in painting, and was soon surpassed by his pupil. Kupetzky, after a time, found his way to Rome, where he underwent many hardships until he was reduced to beggarly straits. His friend Carl von Lichth potatoes at Vienna, where he soon obtained the reputation of the first portrait painter of his time. He numbered among his patrons and admirers the emperor Joseph I. and Charles IX of France, and in 1716 was appointed by Pope Clement XI. to paint the Great to Carlsbad. Peter wished Kupetzky to enter his service and to return with him to Petersburg, but Kupetzky was obstinately fond of his liberty, and would never accept his offer. He entered the society of the Bohemian Brothers. This liberty, however, very nearly involved him in serious difficulties, as he was accused or threatened to be accused, by some of his rivals, of malignant heresy; and Kupetzky was now a man of some importance in the tabernacle. He was accused of being a sympathizer of the Bohemian Society, and he secretly left Vienna and settled in Nürnberg in 1740. Kupetzky painted history and portrait, but chiefly portrait. His pictures have a great deal of character and much effect; his friend and admirer Fuseli says they combine the vigour of Rubens, the truth and elegance of Vandyck, and the effect of Rembrandt. Many of his portraits and some of his pictures have been engraved, especially by Bernhard Vogel, in mezzotint. Prints engraved by Vogel were added to be V. D. Freiselder and published in a collection in folio at Nürnberg in 1745, under the following title:—Joannis Kupetzki, inomparabilibus artificiis, imaginumque miniaturarum, et sepulcrorum ad quinque dodecages arte quam vacant nara acri inacise, a Bernhardo Vogelio, jam vero simillimae continuatiae opera et summoppeo Valentinia Daniellia Freiseldari, Chalcographo. Kupetzky's letters of himself, in which he certifies to the work of prodigious merit, has been copied by L. de Laborde, from Vogel's print and is inserted in a specimen in his history of mezzotint engraving—'Histoire de la Gravure en Mâtre-Or.'—L. Fuseli published a Life of Kupetzky, with one of Rugendas, at Zurich, in 1758. (Fiorillo, 'Geschichte der Zeichnenden Künste,' &c.; Dlabacz, 'Allgemeines historisches Künstler-Lexicon für Böhmen.') KUBDIN, JOHANN, was a landscape painter, who painted the larger portion of that mountain-region which divides the elevated table-land of Iran (Persia) from the low plains of Mesopotamia or Al-Jezireh. As it does not constitute a political division, its boundaries are not exactly determined. Some authors consider the country surrounding the lake of Van as forming a part of Kurdistan, but as that country is mostly inhabited by Armenians, and there are only a few Kurds among them, the mountain-range of the Erdoa Tagh (38° 20° N. lat.) must be considered as constituting the boundary-line between Armenia and Kurdistan. From this range it extends in a south-eastern direction to the province of Louristan, or to about 35° N. lat., the width of this mountain-range may be about a hundred miles. This gives an area of 28,000 square miles, or the extent of Ireland. About three-fourths are under the dominion of the Turkish sultan. The remainder belongs to Persia, and constitutes the province of Kurdistan, of which Kermanshah is the capital. The higher mountain-region occupies the northern portion, and extends from the Erdoa Tagh to the El Khoir Mountains; the south-west approaches the banks of the Tigris south of Jezireh-Ibn-Omar; from which point it extends in an east by south direction across the whole region, being overtopped near the boundary-line of Persia by the elevated peak of Rwandas (10,120 feet above the sea-level). This range is called at its western extremity, where it hardly rises a thousand feet above the sea-level, the Koli Range, but in the middle, where it attains 3000 feet and more, it is the El Khoir Mountains; it is still higher where it approaches the table-land of Iran. The whole country between this range and the Erdoa Tagh is mountainous. In the vicinity of Mounts Kuhistan the peaks are rare and not deeply furrowed by depressions in the shape of valleys. They form a table-land, from 6000 to 7000 feet elevated above the sea-level, whose surface presents a succession of broad hills succeeded by spacious valleys with great summits, and great plains between them. This is the table-land of Ali Bough, on which very few lofty summits rise. The climate is very dry, and the vegetation scanty. It is mostly used as pasture-ground and a few crops. In proceeding from west to east it gradually changes its features. The valleys sink deeper and the masses between them rise higher, and thus the table-land is changed into a mountainous country consisting of high ridges with steep declivities and depressions of narrow valleys between them. Some of the ridges attain a great elevation,
as the Marzanan mountains, the Jawur Tagh, and the Jelooch mountains. The elevation of the Baseb River is about 12,000 feet above the sea-level. The declivities of the ridges and the valleys present a vigorous vegetation in the numerous forests and in the growth of the different kinds of trees, such as oaks, trees, and hazel. The forests chiefly consist of different kinds of oak (Quercus valiosa and Q. infectoria), from which those immense quantities of gull-nuts are collected which constitute the most important product of the region. The wheat and the European cereals are raised; and the orchards produce apples, pears, plums, and cherries. Many of the valleys open towards the plain of Mesopotamia, and these are wider, but they do not contain as much cultivation as those which are more than two miles wide, and generally not half so much.

This portion of Kurdistania is in possession of some tribes of Kurds, which are independent when the pashas of Baghdad and Mosul are not in arms to punish the least act of disobedience. It is as difficult for the Turks to penetrate into the valleys of these regions as for the Russians to get possession of those of Circassia. Probably more than half the population are Mohammedans, and the other half Christians, among whom the Nestorians are the most numerous. Their patriarch resides in Julamerik, a small town situated in the vale of the river Zab Ala, or Great Zab, and enjoys almost the power of a sovereign. Near the southern extremity of this region are the towns of Amadiyah and Rowandiz, two places whence the gull-nuts are exported. Amadiyah lies in a valley from five to six miles wide and very fertile, and is built on high ground near the Zab, which descends below the level of the valley; it contains about 200 houses, many of which are inhabited by Jews. The town of Rowandiz is some miles west of the peak of Rowandiz. It is built on a tongue of land formed by the confluence of two rivers, and contains more than 1,000 houses and perhaps 10,000 inhabitants. Numerous caravans pass between this place and Mosul. They export gull-nuts, madder, hides, and tobacco, and bring back several European goods.

The southern portion of Kurdistania, or that which lies between 36° and 34° N. lat., can hardly be called mountainous, except in its eastern districts, which are contiguous to the elevated plains of Iraq. The surface however is greatly diversified by several ranges of hills. Three such ranges may be traced between the banks of the Tigiris and the eastern mountains. These three ranges go by the names of the Hamrin Hills, the most south-western, All Tagh, the central ridge, and Kara Tagh, the north-eastern. They run parallel to one another from north-west to south-east. The Hamrin Hills terminate on the banks of the Tigiris between the town of Tekrit and the mouth of the Zab Asfal or Lesser Zab (near 32° N. lat.); the All Tagh, south of the confluence of the Zab Ala or Great Zab (near 36° N. lat.); and the Kara Tagh, west of the Zab Ala or Great Zab. These ridges are connected with each other at several places by hilly tracts. It appears however that the greater part of this region is occupied by plains of considerable extent, which are either entirely sterile or possess only a soil of indifferent quality, but along the base of the hills, partly on their declivities and partly in the adjacent level country, there are lands of considerable fertility, well cultivated, and populous. The mountain-region which borders this country on the east varies from ten to twenty miles in width, and it contains several high ranges, as the Shabn mountains, the Azmir Tagh, and the Kurmur Tagh. In the second range the town of Zab Asfal or Omar Gudrun, an elevated mass which appears to rise above the snow-line, as it supplies the adjacent countries with ice all the year round. This mountain-region is united to the high masses surrounding the eastern Table-land of Iraq by the Zab, or Great Zab, which has about 7,000 feet above the sea-level; receives by its numerous affluents the drainage of almost the whole of Northern Kurdistania, enters Southern Kurdistania by a narrow gulf where the Kurmur Tagh meets the Khabur. It descends in a great regular gulf, and joins the Tigiris about 30 miles below Mosul. At the place of their confluence the rivers are nearly equal in size. The waters of the Tigiris are large and rapid, but in July, for about that season the greater part of the snow with which the mountain region is covered during the long winter dissolves, and thus the water brought down by this affluent serves during the summer to keep up the level of the Tigris. The water of the Great Zab is much colder than that of the Tigris. The other large rivers of Kurdistania are the Zab Asfal, or Lesser Zab, and the Diyala. They rise in the elevated region dividing Southern Kurdistania from the Table-land of Iraq. Not far from this first-mentioned country, they fall into the Tigris; they break through all the lower ridges of Southern Kurdistania.

There are several considerable towns in Southern Kurdistania. The most important is Artik (Al-Tur), which lies between the Great and Lesser Zab, in a plain which has a very fertile soil, yielding rich crops without being irrigated. The town is built on some considerable hills, which all travellers consider as of almost indescribable beauty. It contains large mosques, and two baths. Altun Kupri, on the banks of the Lesser Zab, contains 8,000 inhabitants. Kirkuk, farther south, is a rather large place, which carries on a considerable commerce with Sulaimanibagh, to which place it sends large quantities of gull-nuts, honey, sheep, and cattle, brought from the mountain-region lying farther east, and whence it receives European, Persian, and Indian goods. Its population may amount to between 10,000 and 12,000 individuals. There are some manufactures of coarse calicoes.

Suleimania, the modern capital of Southern Kurdistania, and the residence of the hereditary pasha or wali, who however is dependent on the pasha of Bagdad, is not far from the base of the Azmir range, and of the peak called Pir Omar Gudrun, which rises to more than 10,000 feet above the sea-level. The plain of Banna, at the eastern border of the landscape, on which it lies, is frequently watered, and contains more than 1,000 houses and perhaps 10,000 inhabitants. It was built in 1788, and contains more than 2,000 houses and about 10,000 inhabitants, six caravanserai, five baths, and five mosques. The commerce with the adjacent countries is considerable, and is carried on in this place.

Little is known of the climate of Kurdistania, except that of Sulaimania, where the winters are very cold and the summers very hot. Snow covers the plain of Banna for six weeks, or even two months. In May the climate is very agreeable, the thermometer standing at six o'clock in the morning at 66°; at half-past one, at 78°; and at ten o'clock in the evening at 68°. In July the heat is oppressive, especially during the north-eastern winds, which are called sherk, and which affect the human body more than the samouk at Bagdad, as they suddenly raise the temperature ten degrees and more, and produce the most unpleasant feeling. They continue to blow sometimes for eight or ten days, and return frequently, even as late as the end of September. When the sherk does not blow, the changes of the atmosphere are very regular in summer. At sunset it is quite calm; but immediately afterwards a light breeze begins from the east, which increases gradually until the sun attains the meridian, when it blows a gale, or at least strong enough to make the sails go. In July the wind turns to the west and moderates. The mornings are generally unpleasant, but the afternoons are very agreeable.

The fields of Kurdistania produce wheat, barley, and Indian corn; millet and sesame are also cultivated. Olive trees are planted towards the banks of the Tigiris. Tobacco and cotton are largely cultivated, and supply articles of commerce. Legumes, especially lentils, are much grown. Melons, watermelons, and cucumbers are very abundant. The orchards yield figs, pomegranates, olives, oranges, walnuts, apricots, peaches, plums, apples, pears, cherries, and abundance of grapes of good quality; in some places there are plantations of dates. Poplar and chinar trees (Populus orientalis) are planted, and among the forest trees are several kinds of oak, and also wild pear-trees of great size, and between them wild rose-bushes.

Sheep, cattle, and horses abound; the best horses are imported from Bagdad. There are bears, wild hogs, goats, antelopes, and jackals. Land-turtles are frequent, but of small size. Bees are very abundant, and honey is a considerable article of commerce; locusts sometimes lay waste a part of the country; birds are not numerous, except partridges and quails.

Minerals appear to be scarce, except building-stone. In the mountain-region iron and sulphur are met with; and in some places these mines are worked on a small scale. There are several salt springs in the hills between the lesser Zab and the Diyala, from which there are great quantities of salt, as well as of naphtha, which is used in the manufacture of dyestuffs. Naphtha and petroleum abound, especially in the vicinity of Kirkuk, and of some of the springs yield a considerable revenue to the wall; they are noticed by Strabo (p. 736, ed. Cas.).

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As the passes through the ranges of mountains and hills are rather difficult, single travellers are subject to be robbed and murdered. Commerce is therefore carried on by caravans. At least one caravan departs every month from Sulaimanabad for the Persian towns of Tabriz and Hamadan. They take to Tabriz chiefly goods obtained from Bagdad, as coffee, dates, and European and Indian manufactures; and bring back large quantities of silk for the manufactures of Bagdad, and some silk stuffs. The exports to Hamadan consist partly of goods obtained from Bagdad, and partly of the produce of the country, as tobacco, fruits, honey, ginnuts, and the borax consisting of borax especially of the manufactures of Kusbin, as velvets, brocades, cotton goods, &c. The commerce with Kerkuk, which is the chief market for the produce of Kurdistan, is very active; from that place are brought to Sulaimanabad ginnuts, honey, sheep-skins, and cattle; and exchanged for fruits, rice, leather, coffee, cotton stuffs, &c. There is also much commerce with Bad-dad, where coffee, dates, and European and Indian goods are obtained in exchange for the silk brought from Tabriz, and for the produce of the country, consisting of sheep, ginnuts, sumach, cheese, butter, gymnou, tallow, soap, and tobacco. These articles are also taken to Mosul, where they are exchanged for calicoes and other cotton stuffs, silks of Damascus and Diarbekr, stuffs for turbans, boots, and shoes.

The least active branch of the commerce of Sulaimanabad is that with Erzerum, to which place hardly anything is exported except those articles which are imported from Bagdad, for which the returns are iron, copper, and mules. Armenia supplies the whole of Kurdistan and some neighbouring countries with these animals.

The population of Turkish Kurdistan is estimated at about one million, of which four-fifths are Kurds, and the remainder Armenians, Persians, Jews, and Turks. The Kurdish popula-
tion of Persia in Kurdish may amount to 20,000 individuals. But as a numerous colony of Kurds is found in Khorasan, and several tribes have also been dispersed over the hilly region in Mesopotamia, and as far west as Aleppo and the Taurus mountains, the whole population of the nation may perhaps not fall short of two millions. The Kurds are a stout race of men, of dark complexion, with black hair, a large mouth, small eyes, and a savage look. They are very regular in their habits, and are great believers. Their language is derived from the same stock as that of the modern Persian, but not having been fixed by writing, it has degenerated much more. There are several dialects, which vary considerably in proportion to the distance at which the different tribes live from one another. The name of Kurd signifies a valiant warrior, and is therefore adopted as an honourable designation. In Turkish Kurdistan the nation is composed of two castes, the warriors, called Bebebhr or Balaks, and the working people or agriculturists, called Garun. The latter are considered by the Bebebhr as a race of men totally different from them, and are treated as such. The Bebebhr never cultivate the ground, and the Garun never serve as soldiers. A great portion of the population is still addicted to a migratory life. Even when settled in villages, they leave them in summer, and return with their flocks to the adjacent mountain-ranges, from which they return when the harvest time approaches. Though the Kurds are as good Moham-
edians as their neighbours, their women enjoy a much greater degree of liberty, and are frequently met with in the streets. Ladies of rank wear a veil, but the women of the middling and lower classes go out without. The Kurds are much more inclined to associate than their neighbours the Persians or Turks.

The Kurds were known to the ancients. Xenophon (Anabasis, iii. 5, 15, &c.) called them Carduchi (Kapodiaces), and later historians Kapodias, Topodias, Gordiani. When subject to the kings of ancient Persia, they belonged partly to the province of Assyria, and partly to Media, as at present their country is divided between Turkey and Persia. The battle of Gaugamela (Arraca) was fought in Kurdistan, near the modern town of Arbil. After the time of Alexander their country was subjected to the kings of Media, who were dismembered from it in the third century before Christ by the Parthians. It afterwards became a part of the new Persian empire, and was included under the dominion of the caliphs of Bagdad. After the destruction of the Parthian partook of the numerous revolutions in Persia and Mesopotamia. The famous sultan Saladin was a Kurd, of the tribe of Roudhindis, and appeared to have got possession at least of a part of the country. But it soon passed under the dominion of the Moguls (1258), and finally (1588) was conquered by Timur. After the establishment of the Soolkhe dynasty (1602), Kurdistan constituted a part of Persia, and remained so till the seventeenth century, when the Kurds, oppressed by the Persians, revolted, and subjected themselves to the dominion of the Turkish emperor.


Kyd, Thomas, was one of those dramatic poets who immediately preceded Shakspeare. Three plays of his are extant—'The Spanish Tragedy,' 'The Fair Cornelia's Tragedy,' a translation, respectively executed, from the French of Garnier, printed in 4to. 1594, 1595; 2; 'The First Part of Jeronimo,' 1605, 4to.; 3. 'The Spanish Tragedy, or Hierosolyma,' is marked as having been translated, but there are several editions, the oldest known being of 1599, though the play was certainly printed earlier. All the three are in Dodgely's Old Plays. 'The First Part of Jeronimo' is merely an Introduction to the 'Spanish Tragedy.' The former, and probably the latter also, must have been on the stage about the year 1587 or 1588; and they kept their place in 1601 and 1602, when Ben Jonson was paid for making large additions to the Second Part, which are in the modern editions and are quite worthy of his genius. The portions written by Kyd himself are the objects of continual ridicule to Shakspeare and his contemporaries, whose comic characters parody the most extravagant speeches of the tragedians. Yet the play, even in its Introduction, and still more in the Second Part, possesses great vigour, both of imagination and of passion. It is an irregular and rude work, belonging essentially to the infancy of the modern drama, and the conception of its theme and in its language. But it was by no means unworthy of the great popularity which it enjoyed. It is a tragedy of bloodshed, and the writer of 'Titus Andronicus,' to which, however, it is much inferior; it has been observed by more than one critic, that there are in it points which may naturally enough be supposed to have suggested thoughts for 'Hamlet.' Kyd has also been supposed to have been the author of the old 'Taming of a Shrew,' 1594, and of the tragedy of 'Solyman and Perseda, 1599. For the former support there is no ground; and for the other there is no better reason than the particular mention made of the story of a 'Solyman' in the 'Spanish Tragedy.'
L.

LAACHER SEE. (ANDREASCH, P. C.)

LABEO, QUINTUS ANTIUSIS, A Roman of some distinction as a lawyer. It is said that he was born at Philippi, on the side of M. Brutus and Cassius, and after the defeat he killed himself in his tent, and was buried there. (Appian, Civ. Wars, iv. 2. 5.) Labeo was a distinguished lawyer; but contrary to the practice of that time, instead of devoting himself exclusively to one master, he attended several. He lived in the time of Augustus. Labeo was distinguished for his knowledge of Roman law and Roman usages, and also for the freedom with which he expressed his opinions to Augustus (Suetonius, Octavianus Caesar, c. 54.), to whose measure he set himself in opposition. Some critics suppose that he is alluded to by Horace (I. Sat. III. 82), and there might be other persons of the name of Labeo. Atius Capito, his rival in legal knowledge, was raised to the consulship by Augustus in order that he might have that superiority in rank which his talents alone could not give him. Labeo never enjoyed any higher honour than the praetorship. (Tatius, Annu. iii. 75.) The character of Labeo is given by Gallius (iii. 10): 'Labeo Antiusius principally applied himself to the study of the civil law, and publicly gave his opinions to those who consulted him. He was also not acquainted with other liberal pursuits, and he deeply studied grammar, dialectic, and ancient learning; he was also well acquainted with Greek and Latin words, and he advised himself of that kind of knowledge especially to clear up most legal difficulties.' He was confident in his abilities and acquirements, and bold enough to advance many new opinions. He was a copious writer, and is said to have produced four hundred different treatises, from which there are sixty-three excerpts in the Digest, and he is very often cited by the other jurists. Labeo wrote commentaries on the Twelve Tables, fifteen books at least on Pontifical Law, and fifteen De Disciplinis Et Reris. His works which are mentioned in the Digest are, eight books of Hierarchia, of which Paulus made an epitome with additions; and ten books of Posteriora, so called from having been published after his death, of which Javenus made an epitome; but Gallius refers to the fourth book of Posteriora. He also wrote Libri ad Edictum, Libri Pratica Urani, and thirty Libri Pratica Peregrini.

A brief notice of C. Atius Capito may be appropriately introduced here, for he was the rival of Labeo, and founded a sect or school which was opposed to that of Labeo. The father of Capito was an orator; his own name has left a centurion who served under L. Cornelius Sulla. Capito was made Consul Suffectus by Augustus A. D. C. 738, and it was during his term of office that he decided that a patron could make his freedwoman to wife against her consent, a decision perfectly consistent with Roman principles. Capito was a flat-tarer; Labeo was an independent man and said what he thought. Instances of Capito's adulation are recorded by Tacitus (Annu. iii. 76) and Suetonius. He died in the time of Tiberius, A. D. 29. (Annu. iii. 75.)

Capito is often cited by other jurists, Proculius, Javenelius, Paulus, and once by Labeo: they always call him Atius. Capito's reputation as a lawyer was very great. He wrote on Pontifical Law at least five books, as appears from Gallius (iv. 6), and numerous books of Conjectures (Gallius, xx. 2; xiv. 7). He also wrote a single book De Oficio Senatorio, from which Gallius gives an extract (iv. 10), and a book De Jure Sacrificiorum (Macrobius, Saturn. iii. 10). Gallius (xiii. 12) also quotes a letter of Capito, in which he speaks highly of Labeo's legal knowledge. There are no excerpts from Capito in the Digest.

From the time of Labeo and Capito we date the formation of two opposed sects or schools of law among the Romans. The nature of this opposition is collected from the words of Proculius. (Lec. 2. 9.) The differences centre in greater acquirements than Capito and of a bolder temper. He applied to his legal studies the stores of knowledge that were open to him, and thus was led to many new views. Capito stronglyd emphasised the fact that he was one of those who appealed to authority. So far as concerns general principles, we cannot condemn the method of either of these great jurists. Each has its merit, but either of them, if carried too far, may be injurious to jurisprudence. He who handles the matters of law in an enlarged and comprehensive manner, is more likely to arrive at true results; but he who does not well know what the law is, and if he is more eager to change what is established than to maintain its stability, he may destroy the edifice on which he is labouring. He who merely studies the law of Tullius, will be satisfied if he can find authority for anything, however inconsistent with fair dealing and the general interests of society, may be a good lawyer of a kind, but he is a bad citizen. The Roman jurisconsults were mainly engaged in writing on law and giving their opinions (responsum) to all persons who consulted them. Their business was not that of the modern advocate, who has to make the best of his client's case. The opposition then between Labeo and Capito, between him whose method, if judiciously practised, would lead to a progressive improvement of law, and him whose method would stop all such improvement, if strictly adhered to, hardly constitutes a ground of like comparison between lawyers in this country. Numerous questions divided the respective followers of Labeo and Capito; but it is not always easy to discover in the questions, so far as we know them, sufficient to enable us to trace the two opposing principles of the founders of the schools to their just consequences. Much has been written on this matter; and a great deal has been said for which there is little or no evidence.

The followers of Labeo were called Proculian, from Proculius, one of the successors of Labeo. Those who attached themselves to the school of Capito were called Sabinius, or sometimes Schola Cassiana, from Massarías Sabinius and C. Cassius Longinus. For further remarks on the subject of the schools the reader may consult Pucht, Carusus Institut., i. 98. LAMBEAU (LAMPIADE, P. C.) LABIDUS (MULTEIDUS, P. C. S.) LAPIX (P. C. S.) LAVROPHANTHODON, a genus of fossil reptiles from the new red-sandstone strata. (Owen.) (SALAMANDROIDES, P. C.) LACER-TREK. (DAVIES, P. C.) LACPRO (LACRUM, P. C.) LACTICUM, a genus of plants belonging to the natural order Composite, the suborder Lighflorine, the tribe Cicennacae and the subtribe Lactueae of the Crucifolae. It has a cylindrical inbrinated involucre with involuntions at the margin and few-flowered; the receptacle naked; the achenium compressed, wingless, with a long filiform beak, the pappus hair-like in several rows. L. cressa, And. Lettuce, has leaves with a prickly keel, horizontal, oblong, auricled and clasping, mucronate, dentate or sinuated, the beak white, equaling the fruit, which is black. This plant is found on hedges, old walls, and the skirts of fields throughout the whole of England. It is generally grown when procured and dried has the name Lactucarium. (LAC- TUCARIUM, P. C.) This substance is also procured from the garden lettuce (L. sativa), and in the London Pharmacoepoeia the L. sativa is the only plant recognised for supplying this substance. Dr. Christian remarks, 'the London College however, and many cultivators, are wrong in restricting themselves to the garden lettuce, for the preparation of lactucarium.' From information communicated to me several years ago by Mr. Duncan, chemist and druggist in this city (Edinburgh), who has often made lactucarium on a large scale, it appears that the Lactuca virosa yields a much larger quantity, and that the product is of a superior quality. Nor is there any reason for dredging the narcotic properties of the wild lettuce, the scientific name of which has given rise to an exaggerated notion of its activity. The results obtained by Mr. Duncan have been since confirmed by those of Schults in Germany; who found that a single plant of the garden lettuce yields only 17 grains of lactucarium on an average, while a plant of wild lettuce yields no less than 66 grains. — Mr. Duncan has made the observation also that, although the milkiness of the juice increases till the very close of the time of flowering, namely in the wild-lettuce till the month of October in this climate, the value of the lactucarium is determined by the period of its annual flowering: this increases consequently while the juice becomes thicker a material decrease takes place in the proportion of bitter extract contained in it.' For an account of Lactuca sativa and its uses as a salad, see X.2.
Lettuce. This plant appears to have been introduced among the Greeks, and also used in medicine. It is the spatha of Dioscorides, 2:2, and was used by the garden-lettuce were both used among the Greeks and Romans as salads. L. sarvola, Prickly Lettuce, has the leaves with a prickly kind of stem, and is used in salads, as is the oak-leaved lettuce, which is composed of a similar kind of stem, the base white, equaling the pale fruit. It is found plentifully in waste places in many parts of Europe, but is a rare plant in Great Britain. It has a stem from 2 to 4 feet high, leafy and panicked. Its juice is not so acid as that of L. virgata, but possesses the same properties. It is found on the higher hills of Greece, and is probably the spatha of Dioscorides and Spalernian of Dioscurides. The spatha of Theophrastus, B. and of Galen, 2, according to Fras is the L. coriaceae of Scluthus.

There are two other British species of lettuce: L. salignum, with a white elongated base, twice as long as the fruit, the upper leaves entire, acuminate, and L. ericifolius, with the base much shorter than the fruit. [On the Cultivation of the Lettuce, see Lettuce, P. C. J.]

(Babington, Manual of British Botany; Fras, Synopsis Plantarum Flora Classicæ; Christian, Dispensatory.)

LADING, BILL OF. [BILL OF LADING, P. C.)]

LAGENARIA (from 'lagen,' a bottle), a genus of plants belonging to the natural order Cucurbitaceae. The flowers are white, the calyx campanulate, the calyx segments shorter than the tube. The corolla is white, with oboteate petals spreading below the edge of the calyx. It has five triadaphous stamens, the fifth one distinct; three subterminal, two terminal, oblong compressed seeds tufted at the margin, 2-lobed at the apex.

L. vulgaris, common Bottle-Gourd, is a musky-scented plant, and clothed with a soft down. It has a climbing stem with tendrils from 6 to 4 feet long. The fruits are spherical, smooth, and in clusters; the fruit in shape like a bottle, when ripe of a pale yellow color, sometimes six feet in length. When dried it becomes hard, and is used to contain water; it is then of a pale brown color. In its wild state the plant produces a poisonous fruit, and Dr. Rayle states that a very intelligent native doctor informed him that cases of poisoning have occurred from eating the bitter pulp in the district where it grows. Some sailors also are said to have died from drinking beer that had been standing in a flask made from one of those gourds. These injurious effects seem however to be removed by cooking, for Don says that the poor people among the Arabsians eat it boiled with vinegar, or fill the shells with rice and meat, and so make a kind of pudding of it. The pulp of the fruit is often employed in soups: it is bitter and purgative, and may be used instead of coloquint. This species grows wild on the west coast of Africa and on the Arabian coast of the Red Sea. It is cultivated in the neighborhood of the town of Charran; it thrives wherever the mountains are covered with a fit soil. There are three other species enumerated by Don growing in Guinea and the East Indies.

In India it is a great reversion by the Hindus in their religious ceremonies.

(On, Gardener's Dictionary; Lindley, Flora Medica.)

LAGERUS (from Leuc, a hare, and ed, a tail), a genus of plants belonging to the natural order Grumineae. It has a spiked pedicle 1-flowered, scarious glumes ending in a long fringed seta. The outer pale end in two long setae and with a dorsal geminated twisted awn.

L. coerules, the only species, and has a stem from four to twelve inches in height. The leaves are broad and lanceolate, the spikes ovate and subovate. It is found in sandy places in Germany and on the Continent of Europe.

(Babington, Manual of British Botany; Koch, Flora Germanica.)

LAI, MALCOLM, an historian, was born in Orkney, where he possessed a small patrimonial estate, in 1762. He received the rudiments of education at Kirkwall, and afterwards studied at Edinburgh, where he was one of the most active members of the 'Scrupular Society'; an association in which he was prominent, while he was a student. He first tried their prowess. In 1785 he joined the Scotsbar. He does not appear to have obtained much practice as a writer, but he only conscious occasion in which he was professionally employed seems to have been in the defence of some of the parties tried for sedition in Scotland between 1798 and 1799. He is one of the many instances where lawyers have in their works displayed particularly high forensic abilities, without, for some inexcusable reason, being able to rise in their profession. His first known literary effort was editing the last volume of Henry's 'History of Britain,' in 1798, after which he published 'The History of the War in America on the Death of James VI. to the throne of England, to the Union of the Kingdoms in the reign of Queen Anne.' This was published along with two other works, the names of which appearing on the title of the History, are very characteristic of Laing's propensity to enter on disputed points in history or criticism with the spirit of a lawyer. The History as published in two volumes was accompanied by 'Two Dissertations,' both of which were critical, on the supposed Authenticity of Ossian's Poems. Neither of these subjects came within the scope of his History—the former related to a period thirteen centuries earlier. To the second edition of his History, published in 1804, he added a 'Preliminary Dissertation on the Participation of Mary Queen of Scots in the Murder of Darnley.' He was a sagacious, honest, and able historical critic, but certainly too much inclined to take up a side in any question and to keep perpetually in view the circumstances that he was bound to defend that side. His style was harsh and formal, and sometimes obscure, from a pedantic adoption of the mode of his author. He was frequently upon the bosom of his subject, and often too much to him. He was for some time member of parliament for Orkney, and enjoyed the confidence and esteem of Fox. He died in 1818. His brother Samuel Laing, who has written some interesting memoirs, succeeded his brother in the seat. LAMBERT, JOHN HENRY, a distinguished philosopher of Germany, was a descendant from a family which had been compelled to quit France in consequence of the persecutions caused by the revocation of the Edict of Nantes, and he was born at Mühlenhausen in Upper Alsatia, August 29, 1728. He was sent to a school in the town, where he acquired the rudiments of a classical education; but the want of means obliged his father to let him trade a tailor, to withdraw him from thence at an early age.

At home, however, the youth availed himself of every means in his power to preserve the knowledge he had acquired of the Latin tongue; and a great part of each night was spent in reading such of the Roman authors as he could procure, or in studying arithmetic and geometry; the money for the purchase of the books, and even of the candles by whose light they were read, being obtained, it is said, by the sale of drawings which he found time to execute. A taste for literature and science in a young person so situated did not fail to attract notice; but the only immediate advantage which resulted from his attainments was the neatness which the practice of transcribing had given to his hand-writing: this qualification procured for him an appointment as a clerk in the office of a solicitor; and he was afterwards employed, in a like capacity, by the most prominent men in the neighbourhood. At seventeen years of age he became the secretary of Dr. Iselin at Bale; and during the five years in which he held this situation he omitted no opportunity of extending his literary attainments. He then, also, began to acquire a knowledge of philosophy and logic by the study of the works of Locke, Malebranche, and Wolf; and zealously cultivated the mathematical sciences, in which alone, it is observed, he found that the processes of investigation lead directly to truth. In 1749 his patron recommended him to M. de Salis, who was then the President of the Swiss Confederacy, as a tutor to his children; and, having obtained the appointment, he went to reside with the family of that statesman at Coire. Being thus placed in a situation congenial with his taste, and having access to a considerable library—enjoying, moreover, the opportunity of conversing with learned men—he was enabled, while communicating instruction to his pupils, to study the Greek, Italian, and French languages; and particularly to advance his knowledge of optics, astronomy, and philosophy. He was invited to become a member of the Physico-Medical Society of Bale, to whose 'Acts' he afterwards contributed several memoirs on mathematical and physical subjects.

In 1757 Laubert accompanied two of the sons of M. de Salis to the University of Göttingen; and, proceeding from thence to Holland and France, he returned in 1758 to Coire. At Paris he had an opportunity of conversing with some of the celebrated men of the age, particularly D'Alembert and
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Messier; by the former of whom he was afterwards recom-
dended to the King of Prussia, Frederick III. He quit-
ted the family of Count Salm in 1758, and, having been chosen a
member of the Elector Academy of Bavaria, he went to reside
at Augsburg, where he proceeded to Berlin, where he passed the
remainder of his life. He was elected a member of the Berlin
Academy of Sciences, to whose 'Mémoires' he made
many valuable contributions; and he was also appointed
Chief Astronomer to the Academy, in the establish-
ment of a commission for superintending the improve-
ments of the kingdom.

While in Holland, Lambert published, at the Hague, a
tract entitled 'Les Propriétés de la Route de la Lune,' 8vo.,
(1758), in which he examines the path of a ray of light
refracted in the atmosphere, and points out some corrections
which should be made, on account of refraction, in deter-
mind the heights of mountains; and in the following year he
published at Zürich one which was designated 'Freys Per-
pective.' But one of the most important of Lambert's works
is his 'Phosphoria, sive Methodus et Gratulatio Lucis Colorum, et Umbrum,' which was published both at Leipzig
and at Augsburg in 1760. In this treatise the author states, from
his own experiments, the quantities of light reflected from the
exterior of the earth. It was received with delight and honor by
representing them. He compares the brightness of illu-
ninated objects with that of the body which enlightens them;
and he discusses the brightness of the image formed by a lu-
ninated object, and in this work he treats of the influence of
the degrees of illumination on the different planets; and he
describes instruments for measuring the intensities of dif-
ferently coloured light.

In 1761 he published at Augsburg a valuable work entitled
'Insigniores Orbitae Comentarum Proprietates,' 8vo., in
which he contains a formula for determining, in a parabolic orbit,
the perihelion distance in terms of two radii vectores and the
distance of the sun itself. In this work the orbit being any conic
section, the interval between two times of ob-
ervation is expressed in terms of the two radii and the chord
which joins their extremities. This is usually called 'Lam-
bert's Theorem,' and it was certainly discovered by him,
though Euler had, long before, given a like theorem for a
parabolic orbit. In the same year Lambert published at
Augsburg a small work entitled 'Logarithmicae Rechen-
strnadls,' in which are proposed some improvements on Gunter's
'Scale'; and one entitled 'Cosmologische Briefe uebcr die
Einrichtung des Welthaus,' 8vo., in which he considers that
the power of gravity extends to the fixed stars; and he ex-
presses a conviction that the system of the world is
built up from a system of satellites with respect to some celestial
body.

In 1764 was published, at Leipzig, in 2 vols. 8vo., Lam-
bert's work entitled 'Neues Organon;' this work is divided into four parts, of which the first contains a treatise on
thinking, and the second is on truth considered in its ele-
ments; the third is on the external characters of truth; and
the fourth, on the means of distinguishing the real from the
apparent. A sort of supplement to this work was published
by him at Riga in 1771, in two volumes 8vo.; it is entitled
'Architektonik,' and treats of the metaphysics of mathematics;
the subjects being Unity, Number, Dimensions, Continuity,
Limits, and Infinity.

The first mathematical work which Lambert published after
he went to reside at Berlin was his 'Beyträge zum Gebräuche
der geographischen Stereographie,' 12mo. (1773). He then
edited the work of his former teacher, John Bradley (1718 to
1779). This contains some profound investigations relating
to the theory of numbers, and a tract on trigonometry, with
notices on what is called tetragonometry; in it are given also
some important propositions relating to the projections of
the sphere. In the first of those years he published 'Description
d'une Table Ecliptique formant un Tableau vrai de toutes les
Éclipses, tant de la Lune que de la Terre;' and in 1770 ap-
ppeared another of the same nature entitled 'Tableau du
triennes Tabellen,' 8vo. He was joined with Bode, Schultz,
and Lagrange in the publication (1776), under the direction
of the Academy of Berlin, of a series of Astronomical
Tables.

Lambert also wrote a tract on 'Hygrometry,' which was
published at Augsburg in 1770; and he left one on Pyrome-
try, which was published at Berlin, in 1779, that is after his
death; this last contains a biography of the author, by Ever-
hard. Besides these works Lambert wrote numerous papers
on scientific subjects, which were published in the 'Acta
Helvetiae' and in the 'Mémoires' of the Academy of Berlin.
Among the 'Acta' he is the 'Testamen de Vi Caroli eiusque
Dimensione a Saucierio Sculpsit,' and which was
afterwards generalised by Lagrange, and a 'Memoir sur Vibrat-
stringing.' The 'Mémoires' of the Academy contain his
papers on the Incommensurability of the Circumference of a
Circolo to its Diameter; on Hydraulica; Wheels; on Windmills; and on Friction. He moreover pre-
pared two papers in which he had discussed all the known ob-
servations on Jupiter and Saturn; and these were published in
the same 'Mémoires' (1780) which contains the estab-
lishment of a commission for superintending the improve-
ments of the kingdom.

Lambert was endowed with a strong memory and a fertile
and well regulated imagination: his manners were simple, and
he is said, in his dress, to have disregarded the fashions of the
time; but he was both esteemed and beloved by those who
knew him intimately. He died Sept. 25, 1777, being
then only forty-nine years of age. All the manuscripts left
by him were purchased by the Academy of Berlin, and were
subsequently published by John Bernoulli, a grandson of the
celebrated John Bernoulli of Basle.

(The Berlin Mémoires.' Biographie Universelle.)

LAM, GIOVANNI, born at Venice, in Tuscany, in 1697, studied law at Pisa, took a doctor's degree, and after-
wards repaired to Florence, to exercise his profession. But
his fondness for literature, and especially classical and ecle-
siastical studies, diverted him from the profession of a
lawyer, and he became an author. His first work was in defence of the
Nicene Creed concerning the Trinity, and against Leclerc
and other Socinian writers. Lami contended that the Nicene
Doctrine and the dogma concerning the Trinity were but
the early promulgations of Christianity in the Apostolic times.
His work is entitled 'De recta Fatum Nicenum Fide,'
Venice, 1730. Lami travelled with a Genoese nobleman to
Vienna, where he resided some time, and he afterwards visited
France, whence he returned to Florence in 1732, where he
was made librarian of the Riccardi library, and Professor of
Ecclesiastical History in the Florence Lyceum. At Florence he
published 'De Ecclesiologia,' 8vo. Florence, 1738, which is a sort of continuation of his former work.
The Socinians having assumed that the notion of the Trinity had been derived from the 'Logos' of Plato, Lami
undertook to prove, among other things, that the apostles and
their first disciples were too ignorant of profane learning to
be acquainted with the writings of the Greek philosophers.
Lami's work also contains much miscellaneous and recondite
erudition concerning the early ages of Christianity.
The author treat's the style of dress, and of the manners of
the primitive Christians, of the amusements of the apostles, and
of the early translators of the Gospels and Epistles, of the
cryptical books and libraries of those times, and lastly he gives an historical account of the old MSS. of
the Gospels, Epistles, and other parts of the New Testa-
ment which existed in the libraries of Florence.
In 1740, Lami was named to a new library journal, entitled
'Novelle Letterarie,' which he carried on till the year 1760,
at first with the assistance of Targioni, Gori, and other learned
Tuscans of his time, with whom he afterwards quarrelled, and
he then continued the work alone. This publication was
the source of some annoyance to him, both from private animosity
and from the jealousy of the censorship.

Lami made a selection of edited works, or fragments of
works, from the MSS. of the Riccardi library, of which he
was keeper, and published it in a series entitled 'Delizia
Eruditorum,' 16 vols. 8vo., Florence, 1736—69. He also
published the work of John Bradley in 12 vol.
folio. He wrote short biographies of many illustrious Italians
of his age: 'Memorabilia Italorum Eruditione prestantium
quibus vertens Seculum gloriarun,' 2 vols. 8vo., Florence,
1743—7. He published in Greek the letters of Gabriel
Severus, Archbishop of Philadelphia in Asia Minor, and of
other Prelates of the Greek Church: 'Gabrielis Severi et aliorum Graecorum Recentiorum Epistolae,' 8vo.,
Venice, 1754. He had contributed a verse to a song on
Churches from the Council of Florence of 1439; a subject
which he observed had been much neglected by writers of
ecclesiastical history; but this undertaking was interrupted by
Lami's death, which occurred in the year 1773, in the church of Santa Croce; and the following sentence was
engraved on his tomb: 'Doctissimi Polyhistori etatis suae
nulli secundus.' He left all his property to the poor. Fabbroni
and Fontanini wrote his biography. Besides the works already
mentioned, Lami wrote satires both in Latin and in Italian, especially directed against the Jews, whom he strongly disliked. He also published, 1, ‘Lezioni di Antichità Toscane,’ 2 vols. 4to., 1766. 2, ‘Ricordi Romani richi di Vita,’ Florence, 1748. 3, ‘Catalogus Codicium MSS. qui in Bibliotheca Florentini Fidei, seu in Bibliotheca Universitatis Florentinae, & Bibliothecas tav. & Annalium,’” 1756, and other minor writings.

(Corniani, I Secoli della Letteratura Italiana, and the works of Lami above quoted.)

LAMIUM, a genus of plants belonging to the natural order Labiatae. It has a 2-lipped corolla, the upper lip arched, lower lip trifid. The lateral lobes minute, tooth-like, or obsolete, rarely elongated. The anthers approach in pairs, and the stamens are inserted at about a right angle to the axis of the corolla. The calyx is 5-toothed and holl-shaped, the teeth nearly equal. This genus includes the dead, blind, and dumb nettles of our peasants, so called from their resemblance to the Urbin in many points, except their stings.

*L. amplexicaule* has roundish corolla obtuse leaves, the lower ones stalked, the upper ones sessile and clasping; the teeth of the calyx are longer than the tube at length convolute, the lateral lobes of the lower lip of the corolla toothless; the nuts small, and of an oblong oblong shape. It is found in sandy and chalky fields in Great Britain, the North of Africa, and Middle Asia.

*L. amplexicaule* differs from *L. amplexicaule*, obtuse leaves, and is distinguished by the teeth of the calyx being longer than their tube, hispid, and always spreading. The lateral lobes of the lower lip of the corolla with a short tooth, the teeth being longer than those of the former species, and of an oblong shape. This species is common in Scotland, Sweden, and the North of Germany.

*L. purpureum* has a pale purple corolla, spotted with red, the lateral lobes of the lower lip having 2 teeth. The nuts oblong, or about twice as broad as long. It is found in Great Britain and Sweden, where, according to Linnaeus, it is boiled and eaten. It was formerly used in medicine, but is not used now.

*L. incisum* has but one tooth in the lateral lobes of the lower lip of the corolla. It is a British plant, and is likewise found in France, Germany, and Sweden.

*L. album* is distinguished by having the calyx teeth as long as the tube, all separated by acute angles, the upper one distant from the others. The corolla has 3 teeth, and is large and white. It was once used medicinally, but is now disregarded. Like *L. purpureum*, this species is eaten in Sweden as a pot-herb. It is found in Great Britain and the southern parts of Europe.

*L. maculatum* has the calyx teeth longer than their tube, the upper ones separated from the others by broad obtuse angles; the lateral lobes of the lower lip of the corolla with one tooth. It is found in Great Britain and the continent of Europe.

*L. striatum* has deeply cut ovate leaves, the corolla 3 times as large as the calyx, which is glabrous. It is a native of Greece in waste places, and is supposed by Fraas to be the same as *L. striatum* var. *quadrifolia*, 9, 105.

There are several other species of Lamium, growing chiefly in the southern parts of Europe. They are not worth cultivation for ornament, but will easily grow in any soil or situation, and are to be propagated either by division or by seed.

(Don, Gardener’s Dict.; Babington, Mon. Brit. Bot.; Fraas, Synopsis Plantarum Floreae Classicarum.)


LAMOTTE. [Matté, L., P. C.]

LAMP (Lights, Artificial, P. C. S.)

LAP (Laws) COUNTY PALATINE OF. [Palatine Counties, P. C. S.]

LAND. [Taxation, P. C. C.]

LANDTAX (LANDTAX) TENANT AND LANDTAX. [TENANT AND LANDTAX]

LANGBAINE, GERARD, D.D., born in Westminster about 1608, was successively a servant, scholar, and fellow, of Queen’s College, Oxford; and he held the places of keeper of the archives of the university and provost of his college for a good many years before his death, which happened in 1658. He was a studious and timid man, who contrived to steer through the political storms of his time without giving serious offense. He lived Longinus, and published several works of his own chiefly on church questions. But his chief usefulness was in his unprinted collections, which included several catalogues of manuscripts, often referred to by Warton and others.

GERARD LANGBAINE, his son, was born at Oxford in 1656, and, after having received an elementary education, was apprenticed to a bookseller in London. An elder brother having died before his time, he became his father’s heir, and was a commoner of University College. He betook himself however to idleness and low extravagance, and spent a great part of his property; but after a time he reformed, and regained of his earlier tastes but his love for the theatres. He made a very large collection of old plays, amounting, as he says, to almost a thousand. He made use of these, first, in a republication of a catalogue of plays made by Kirkmann, a collector of old books, but who had exhausted its stock, ‘Folium et umphans,’ 1687, 4to. This work, speedily sold off, was improved into ‘A New Catalogue of English Plays,’ 1688, 4to. Still further additions and amendments produced his ‘Account of the English Dramatic Poets,’ 1691, 8vo, 1699 (by Gilson), 1719 (by Giles Jacob, for Curll). The criticism contained in this work is shallow, prejudiced, and obsequious. The author pronounces Sir Robert Howard to be an admirable poet, and prefers Shadwell’s plays to Dryden’s. But, in relating facts and describing editions, he scrupulously sets down what was before him; and although the information he gives is very incomplete, his work is the most trustworthy of our stocks of old plays during that period. He is the only bookseller employed in the purchase of the gallery of the Duke of Mantua, for which Charles gave 20,000.—it comprised the Triumph of wit and speech by Mantegna. [HAMPTON COURT PICT.

LAP (Laws) GALLERY, P. C. S.]

Laniere was a better musician than a painter. He was appointed in 1626 Charles’s chaplain-master, for which he had a salary of 200l. per annum; he was also closet-keeper to Charles. There is in Ben Jonson’s works a masque, which was performed in 1617 at the house of Lord Hay, for the entertainment of the French ambassador, and for which Laniere both painted the scenes and composed the music. He also wrote and set the hymns which were written by Thomas Fierce for the funeral dirge of Charles I.

Laniere lived to see the dispersion of the collection which he himself had been mainly instrumental in forming. He purchased many pictures at the sale of 200l., others were purchased by his brothers Jerome and Clement. Laniere appears to have been a general dealer in pictures, and, according to Sanderson (Gra. 210), to have been keen of art for a long time, and that sc.Vector employed him in the purchase of the gallery of the Duke of Mantua, for which Charles gave 20,000.

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polcnon, the Duke of Wellington, and Marshal Ney and Soult. He was born of humble parents, and was at first hired as a day labourer. In 1786, having joined a battalion of volunteers raised in the department of Gers, of which he soon became sergent-major. His first campaign was with the army employed on the frontiers of the Pyrenees. In 1792, at the suggestion of its living father, he had obtained the rank of ‘chef de brigade,’ which nearly corresponds to that of major among the English troops. After the political crisis of the 9th Thermidor (July 27th), 1794, he partook in the destinies of the new régime. On that occasion, he quitted his native region, and accomplished his ambition, by uniting their connection with the younger Lobespierre; he then retired to Paris, where he formed an acquaintance with those two distinguished commanders, whose future glories he was destined to share. His calm and daring character especially attracted the notice of Bonaparte, who employed him in the affair of the Sections [BONAPARTE, P. C.], and he afterwards joined him with the army of Italy. After the victories of Montenotte and Milleisano, April 26th, 1796, where he greatly distinguished himself, he was made colonel of the thirty-second demi-brigade, in the place of the gallant Rampon, who was raised to the rank of general. Among his many duties, in the capacity of a minister of Simonsen, he had occasion to cross the river Po, he was the first with a few grenadiers to arrive at the opposite bank; and likewise, on the bridge of Lodri, he was foremost in effecting the perilous passage. In 1797 he entered the camp of Vienna in command of a detachment with distinction till the signing of the treaty of Campo Formio. [CAMPO FORMIO, P. C.] He afterwards formed part of the expedition to Egypt, where he rose to the rank of a general of division, and distinguished himself high honour. He greatly contributed to the victory gained by the French at Aboukir, and was dangerously wounded at the siege of Acre.

When Bonaparte determined upon leaving Egypt, Lannes was one of the generals chosen to accompany him to France [BONAPARTE, P. C.; KLEBER, P. C. S.], where he rendered him material assistance in the revolution of the 18th Brumaire (November 9th), 1799, and as a recompense for his services on that occasion he was named commander of the Consular guard. He was afterwards employed in the south of France, at the head of the ninth and tenth military divisions, to suppress the insurgent Jacobins. From thence he was recalled by the First Consul, in the year 1800, to join the expedition to Italy, and he shared the dangers and labours which attended his services on this occasion was so great, that some years afterwards, Montebello was the title chosen for the dukedom to which he was raised. After the battle of Marengo, in which he likewise greatly distinguished himself, he received a sabre of honour, and was selected to present to the government at Paris the standards that had been taken from the Austrians. In 1801 he was sent to Lisbon by the First Consul in the capacity of minister plenipotentiary of France, a character for which his previous habits especially fitted him. The blunt frankness of a soldier, joined to his natural impetuosity of disposition, but ill accords with the close reserve of conduct so essential in a diplomatist. This very defect however proved of advantage to the cause in which he fought, and bore a determined bearing obtained from the feebly government of Portugal every measure which Napoleon at that time required. Several characteristic traits of General Lannes’ behaviour at the moment of Ligny are to be found in the recently published Memoirs of the Duchess of Abrantes [Madame Junot], whose husband was sent to supersede him as ambassador.

On his return from Portugal in 1804, Napoleon, who was now at the height of his power, considered the撤出 of a subject and sent him towards Duke of Montebello. In the Austrian campaign of 1805 Lannes was appointed to the chief command of the left wing of the French army, and was present at the battle of Wagram, where he distinguished himself by the gallantry he displayed towards Duke of Montebello. In the great and decisive battle of Austerlitz, December 2nd, 1805, where he manifested his usual courage and gave proof of increased skill and judgment, he had two of his sides-devils cut off by a direct shot from the enemy’s balls. He was instantly followed by his men, whom
The gallant spectacle of their leader's courage had animated, and, by this daring and decisive measure, the breach was quickly passed, and the town was gained.

The last but not least noble exploit of this distinguished general was the defence of the valley of Eauling, in the sanguinary battle which has been named from it, and the grand attack on the Austrians, which, though unsuccessful in its result, was conducted by Lannes with great skill and success.

While the French were thus occupied, the Austrians directed their attention to the island of Lobou, their vaunted bands were attacked by fresh troops, which the Archduke Charles brought up in constant reinforcement from the main body of his army, and checked the advancing numbers of the Austrians. The French had reserved their fire till the enemy had approached within a few yards of them, and then commenced a most desperate struggle.

At that critical moment Lannes distributed amongst his horse, that he might be least exposed to the sweeping fire of the Austrian artillery, when he was struck by a cannon-ball, which carried away the whole of his right leg and the foot and ankle of the left. Napoleon was directing the position of some batteries, when he beheld the almost lifeless body of his heroic marshal borne off from the battle. The last scene in the life of Lannes has been very differently related, and some of the circumstances of the last moments have been exaggerated.

The description given of it by Alixson, which is chiefly derived from the accurate narratives of Poleit, Savary, and Thibault, is that which appears most consonant with truth. He was reproached with the shattered remains of his heroic companion, Lannes had still sufficient strength remaining to seize his hand, and, with a voice weakened by loss of blood, to bid him a last adieu. 'Live, my friend, as the saviour of the world, and bestow a few thoughts on one of your best friends, who is shortly to be no more.' Beside the litter of his early friend, of the sharer of his perils, and the partaker of his fortunes, knelt and wept the Emperor of Europe. "Lannes," exclaimed Napoleon, "do you remember me? is it the emperor, it is Bonaparte, it is your friend; you will surely yet be preserved to us." 'To live in order to serve you and my country is my wish," he replied, "but in an hour I shall be no more.' On no occasion had Napoleon evinced such deep emotion. Nothing, he observed to Massena, 'but so terrible a calamity could have withdrawn me for a moment from the care of the army.'

Critical indeed were the circumstances in which that army was then placed, and the fate of Napoleon's empire was depending on the issue; but seldom can ambition, even amid its highest efforts, stifle the genuine emotions of the heart. For some time Napoleon remained in the presence of the emperor, during which he was constantly visited by the emperor, and on the 31st of May, 1809, he expired. At the same time had fallen with him the brave General St. Hilaire, whom, like Bayonne, Napoleon had styled 'the knight without fear and without reproach.'

Lannes, unlike many of Napoleon's generals, had acquired a constantly increasing military reputation. In the first part of his career courage predominated over judgment; but experience was daily producing in his mind a more just equilibrium between those two qualities so essential to a commander. 'I found him a dwarf," said the emperor to Las Cases, "and I lost him a great.' And in another conversation with this faithful companion of his exile, he remarked of this marshal that 'he had great experience in war, having been in fifty-four battles and three hundred combats. He was cool in the midst of fire; possessed of a clear penetrating eye, ready to take advantage of any opportunity which might present itself. Violent and hasty in his temper, even in my presence, he was however ardently attached to me.' His chief fault was a carelessness of the future, too common among the soldiers of that period; a large shaver in the rewards which Napoleon so lavishly bestowed upon his generals, he was the prodigal of his means as of his blood. But to his credit it may be said that he never received a pension of his in coming, but went to the relief and support of his poorer companions in arms.

Lannes had married Madeleine Louise de Ghebhenacus, a young woman of exquisite beauty and possessing manners. When she became a widow, Napoleon evinced by the most assiduous attention to her the highest respect he bore for the memory of her distinguished husband. She was afterwards appointed a lady of honour to the Empress Maria Louise. The present Duke of Montebello, Lannes' eldest son, has married an English lady, Ellen, the daughter of Charles Jenkins, Esq.

The Military Life of Lannes, written by Mons. René Peria, was published at Paris, in 1810.

(Alixson, Hist. of Europe, vol. iii. and viii.; Las Cases, Mémoire de St. Eléon, vol. ii.; Mémoires de la Duchesse d'Abbrams; Court and Camp of Napoleon, Murray; History of the War of the Sixth Coalition, France, 1811, 1813; Bibliothèque Universelle, &c., dixième partie, Paris, 1829; Biographie Moderne, Paris, 1815; Napier, Hist. of the Penin-
sulwar War.

LANTERN. [SKYLIGHT, P. C.] LANTERN, MAGIC. [MAGIC LANTERN, P. C. S.] LANZAROTE, one of the Canaries, lies about seventy miles from the mainland, and is about one hundred and sixty miles in circumference, between 28° 02' and 29° 14' N. lat., and 13° 50' and 14° 29' W. long. It is separated from the island of Fuerteventura, which lies south of it, by a strait which is from four to six miles wide, and called La Bocaya. Lanzarote extends in a north-east and south-west direction about thirty-one miles, with a breadth varying between five and ten miles. The area is estimated at 325 square miles, or about forty miles more than the county of Middlesex.

North of Lanzarote are five small islands: the largest are Algebranza and Graciosa, which are inhabited, and produce barley and orchids; the others are only rocks. The strait between them is so narrow that it is in most parts rather more than a mile wide, and is the most spacious and only safe port for large ships in the Canaries, but useless as a harbour for trade, because the coast of Lanzarote rises so steeply, until it reaches the height of 1500 feet. The mountain mass to which these cliffs belong contains an extinct volcano, called La Corona, whose edges rise to the elevation of 1506 feet above the sea. From this point the mountain mass gradually descends southward, and is surmounted by a few wide valleys which open to the south-west, and in which palm-trees and fig-trees abound. It terminates in an extensive sandy plain, which surrounds Teguise, the capital of the island. West of this place the country is covered by numerous hills surrounded by fields of lava. All these hills have a conical form, consist of scoria and ashes, and have craters. These hills were formed by a terrible eruption which took place in 1720. Such masses of lava were thrown out by them, that one-third of the island, and that the most fertile portion, was converted into a stony waste. The streams of lava ran into the sea, owing to which the whole western shore is precipitous in the island, which from one little bay called Janubio, where once a harbour for small vessels, which by the eruption was converted into a salt-water lake. The eastern shores are neither so steep nor so precipitous as the western, and, extending straight southward, called Montana Blanca, lies to the west of the lava tract, nearly in the centre of the island; it rises to 2000 feet above the sea, and is cultivated to the summit.

The climate of Lanzarote is exceedingly hot, but during certain seasons, when the south-east winds, having passed over the Sahara, extend to the island: these winds frequently bring hosts of locusts with them. In spring and the early part of the summer northern and north-eastern gales are frequent; they last for several days, and blow with such violence as to prevent the growth of trees, which are only found in the valleys of the northern tract, where they are protected by the high ground north of them. Rain is scarce, and the crops are uncertain. A drought which lasted from 1768 to 1771 compelled nearly the whole population to emigrate; the water in the cisterns had entirely dried up. There is only one spring on the island, and even that is inconsiderable.

Wheat, barley, Indian corn, and potatoes are extensively cultivated. In some parts are large vineyards; the grapes are of a superior flavour, and the wine of Lanzarote is preferred to that of the other islands. The most important product is the barilla, which is obtained from the Mesembryanthemum crystallinum: this plant is indigenous, but has also become the object of extensive cultivation. The South embryo is a delicate, white, hair-like plant. The fruits are small, but very small; they are only kept for agricultural labour. Very few horses and mules are kept; but there are many donkeys and camels. There are many goats and sheep. There are few hogs. On the plains, the so-called El Río salt is made, and a considerable quantity is exported to the other Canaries.

The population is estimated at about 18,000 individuals. They are strongly built, and of a dark complexion. May have
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Black curly hair, and some features which prove that the ancient Spanish settlers have intermarried with the Moors and Negroes of Africa. The inhabitants are mostly occupied with cultivating the ground; but several families gain their livelihood by fishing. Three vessels on an average are annually sent to the coast of Africa, where the Assou-grogs, as the native canoes of Cape Bojador to Cape Blanco; each vessel makes between eight and nine voyages, and has a crew of from thirty to forty men. They take chiefly cod and Brent, and salt them. Salt-fish constitutes the principal food of the population.

The capital is Teguine, a small place consisting of about two hundred houses scattered over a small hill. On the eastern shore is the harbour, which has a number of foreign vessels visiting annually the island is stated to vary between twenty-five and thirty. Lanzarote exports to Teneriffe and Palma considerable quantities of grain, brandy for the West Indies, cattle for the slaughter, and quantities of green and dry timber and firewood, besides foreign articles. From the small port of Papagayo, near the southern extremity of the island, a large quantity of brandy is sent to Fuerteventura, whence it is consumed in the interior of the island.

Lanzarote was the first of the Canaries which submitted to the Spaniards. They took possession of it in 1404. In the sixteenth and seventeenth centuries it was frequently laid waste by the Moors from the coast of Africa. This circumstance, with the terrible eruption of 1780, and the great dearth in 1768 to 1771, prevented the inhabitants from improving their agricultural condition. But in the middle of the eighteenth century a gym of the barilla plant was introduced, and since that time the condition of the population has improved.

(Humboldt, Voyage aux Régions Equatoriales du Nouveau Continent; Von Buch, Physikalische Beschreibung der Canarischen Inseln; Arlett, Survey of some of the Canary Islands, &c., in London Geographical Journal, vol. vi.; Mac Gregor, Die Canarischen Inseln nach ihrem gegenwärtigen Zustande.)

LAPERO, ARNOLFO DI, the name by which a very celebrated and one of the most early of the Italian architects is known. He is said to have lived at the time of Leonum German, whose house in Lucca he decorated, and who was sometimes called in Florence Jacopo Todesco, but more frequently Lapo. This Lapo, who executed many works in Florence, died there, according to Vasari, in 1202.

L. minor has a tapering fleshly root, an erect stem, 3 feet or more in height, solid, leaffy, round, and with many wide-spreading branches. The leaves are stalked, broad, heart-shaped, and being 3-ribbed at the base, somewhat hirsute and downy beneath. The flowers are axillary, with their anthers and stigmas purple. When in flower the involucre readily breaks from the stalk, and is known in the country by the name of a fur. It approaches the cost of the hair and clothing of those who pass by, and it is almost impossible to become free from it without breaking the scales and scattering the fruit. The root is reckoned tonic, aperient, and diuretic. It has some power in the form of a decoction in rheumatism and rheumatism of the skin. Sir Robert Waldolph recommends it as a remedy in gout, and some have used it as an excellent substitute for scarapilla. The fruit is bitter and slightly acid, and has been prescribed as a diuretic. It grows in waste places throughout Europe and the West of Asia.

L. major and L. tomentosus are species which are found in Germany and Switzerland, but are not used in the arts or medicine.

(Lindley, Flora Medica; Koch, Synopsis Flora Germanica.)

LAPSANA, a genus of plants belonging to the natural order Composite, the sub-order Tubulifloro, tribe Scioneceae, and the sub-tribe Cardineae. It has an equal and many-flowered homogamous head, a globose involucre, with imbricated coriaceous scales. The receptacle is rather fleshy, flat, and with stiff fringes. The corollas are 5-lobed, regular, and with a 10-nerved tube. The stamens have papillate filaments, with anthers terminating in filiform appendages. The fruit is oblong, laterally compressed, smooth, and transversely wrinkled.

L. communis, Nipple-wort. It has dentate or lobed stalked leaves, the lower leaves tuncate; the involucres glabrous and angular; the stem panicked. The stem is from one to three feet in height, branching above, with many small-headed florets. It is found in waste uncultivated land, and derives its common name from its reputation in village medicine, as a soothing application to inflamed nipples, and is used in many of our provinces as an external application in wounds and ulcers.

L. fistula is a species of this genus, which grows in Switzerland and the regions of the Alps.

(Lindley, Flora Medica; Koch, Synopsis Flora Germanica.)

LAPSE. [Beveridge, P. C.]

LARDIZABAL, a genus of plants belonging to the natural order Magnoliaceae, recorded by the name of St. Paul after Michael Lardizabal, of Uruguay, a Spanish naturalist. It has discoid or polypodium flowers. The sepals and petals disposed in a ternary order in 2 or 3 series. The stamens of a monadelphous cym. The ovary is 3-locular, the fruit a 3-valved, 3-seeded. The pulp of the fruit sweet and edible. It has leaves 2-5 ternate; the leaflets oblong, acute, unequal at the base, a little toothed; two large unequal ciliate hairs situated at the base of the peduncle. The plant is not seen in Peru. About Arauco it has an edible fruit, which is gathered and eaten.
sold in the markets of Chili and Peru. The pulp of the fruit is sweet and grateful to the taste. It is called in Peru Aguil-bougal and Guibougal; and in Chili by that of Copo-

L. reticulata and L. trifoliata are climbing plants, native of Chili and Peru, but their fruits are not eaten.

(Latin Formulary Dictionary.)

LARREY, DOMINIQUE-JEAN, BARON, was born at Beaufoul, near Bagnères de Bigorre, in France, in July, 1786. He studied the elements of medicine and surgery at the hospi-

tale at Toulouse under the direction of his uncle Alexis Larrey, who practised medicine in that city. In 1797 he went to study his profession in Paris, and obtained the appointment of surgeon to the regiment of Vignolle, in which he served until 1813. He returned to Paris at the commencement of the Revolution, and in 1792 joined the French army which was then carrying on its operations in the Rhine. Here he disting-

Laserpitium (the name of the ancient Sphilmum), a genus of plants belonging to the natural order Umbelliferae. It has a calyx with a 5-toothed rim; the petals oblong, emarginate, with an indented lobe; the fruit comprising, from the back, or somewhat taper, 8-winged, that is, the half-fruits with five primary flibilem ribs, and four winged secondary ones; a vitta in the channel below each secondary rib. The petals, 2-3-pinnato leaves, and entire toothed or cut segments; marcescent and showy umbels; the involucres many-leaved; the flowers white, rarely yellow.

L. glabrum, glabrous Lasera, has bipinnate leaves, quite glabrous in every part; the leaflets obliquely cordate, here and there mucronate and toothed; leaves of the involucres setaceous; wings of the fruit equal, rather curved. This plant is a native of mountainous districts of Europe, dry and rocky places. It attains a height of one or two feet on the Alps, but in cultivation is a much larger plant. The root is filled with a gum-resin, which is acrid, bitter, and even some-

L. silus has bipinnate quite glabrous leaves; leaflets lanceo-

L. silus is supposed by Fras to be identical with the Arvensis of Dioscorides, 3, 51. Sibthorp found this plant he species of L. gregos, which is narrow, and is found in Spain, also yields a gum-resin. There are several other species of Laserpitium described, and many of them yield a gum-resin, which is one of the secretions of the order to which these plants belong.

(Lindley, Flora Medica; Don Gardener's Dictionary; Fras, Synopsis Plantarum Florae Classic.)

LASTÈRE, a genus of Ferns, belonging to the tribe Aspidiaceae. It has a reniform indusium attached by the sinus, the veins distinct after leaving the midrib, and not uniting with those of the adjoining pinnules.

The following species of this genus are described in Rabing-

L. Neopolliniana has a herbaceous scabrous erect stem, with roundish seven-nerved leaves, and seven blunted lobes; the pedicels axillary and aggregate, the involucres shorter than the calyx, the lobes of the calyx acuminate. The flowers are blue with obtuse petals. This species is a native of Italy, Spain, Portugal, the north of Africa, and the Canary Islands, on maritime rocks; also in Britain, in the Isle of Wight, on Portland Island, in Cornwall, and Devonshire. It is the Malacian of Thesmophra (Hist. Pl., 1; 5; i. 14).

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L. Otbis has a strigilated, and rarely scabrous, from distant fascicles of hairs; the leaves are soft, woolly, five-lobed, the upper ones three-lobed, with the middle lobe elongated; the uppermost leaves are oblong, almost undivided, the flowers solitary, not in an inflorescence. It is a native of Provence, in hedgerows about D'Ihivres.

None of the species of Lavatera are of any importance or
value, excepting as ornamental plants. Many of them are herbs, and the growth of a tresson has thus become a luxury of the rich.

The greenhouse and frame species will thrive well in a mixture of loam and peat, or any light soil; they may be planted out during the summer against a south wall, and if protected in the winter by a strong frame or by a piece of glass will thrive all the year.

The perennial species grow in a kind of soil, and may be propagated either by dividing the plants at the root or by seeds. The annual and biennial kinds should be sown in different frames and in a temperature of 50° by the end of January of the year. The species chiefly worth cultivation in gardens are L. Olba, Iinnz, unguiculata, Nepenthes, Oelsia, Australian, Astringica, and Trissmis.

(Don, Gardener's Dictionary; Babington, Manual Brit. Bot.)

LAW, CRIMINAL. The object of the English law as of every other system of Criminal Law is the prevention of injuries by the terror of punishment; but it is not every injury the commission of the which law thinks fit to prevent by such means; in most cases it is satisfied with the redress of injuries after they have been committed, either restoring the party injured to his right, where that is possible, or by giving him compensation in damages. In law, an injury is any violation of a legal right or omission of a legal duty; a crime, then, may be defined to be such a violation of a legal right or omission of a legal duty as subjects the person guilty of it to punishment. Such acts or omissions for which the law affords redress only have, in England, been usually denominated civil injuries as distinguished from crimes. It is to be observed, however, that, in strictness, every crime includes an injury, but not every injury is a crime. Crime, therefore, by the law, is properly defined to be actionable by the party injured, and he is entitled to redress. In felony, indeed, such injury is said to be merged in the crime; but this doctrine appears to have originated in the circumstances of all felonies having, with one or two exceptions, been originally punishable with death and having worked a forfeiture of all the offender's property, and so rendered redress impossible.

Crimes, according to the English law, are divisible into two classes, as depend upon the mode of proceeding peculiar to each, viz. into

1st. Such as are punishable on indictment or information (the common law methods of proceeding).

2nd. Such as are punishable on summary conviction before a justice or justices of the peace or other authorized persons, without the intervention of a jury (a mode of proceeding derived entirely from special statutory enactments).

It is proposed, in the first place, to treat of offences punishable on indictment or information, and afterwards to shortly refer to those punishable on summary conviction.

Offences punishable on Indictment or Information.

Indictable offences are distributable into four classes, viz.: tressons, praemunire, feloies, and misdemeanors. Persons who commit the offences which constitute the last-mentioned division may also be prosecuted by criminal information instead of being indicted.

The distinction between these classes is, for the most part, a merely formal difference, and is only intended to render more certain the rule which constitutes the consequence of the following upon the nature wholly indistinguishable are, in many instances, separated and subjected to punishments widely disproportionate, and to forms of procedure widely dissimilar. In fact, the only real distinguishing feature between one class of crimes and another, at the present day, is to be found in certain peculiarities of punishment and procedure incident to each. Formerly, however, the classes were marked by distinctive characteristics; but they have subsequently, either by artificial constructions of the courts or by legislative enactment, been made to embrace offences of a very different nature from any of the earlier classes, and within the last, the crime of treason, whether high or petit, implied a violation of the allegiance due from an inferior to a superior. In the ease of high treason, so called by way of eminence distinguished from petit treason, which may be subject to his liege lord and sovereign; and in case of petit treason, which was limited to the murder of a husband by his wife, a master by his servant, or an ecclesiastic by his inferior with whom he was in the pacque of the allegiance of private and domestic faith.

The characteristic above pointed out can no longer be traced in many of the various constructive treasons which have been from time to time enacted. It will be necessary, therefore, here to give a single illustration of the mode in which the law has treated this class of offences, and in particular with its original design. By one of the clauses of the statute of treasons (25 Edw. III. c. 2) it is declared to be treason to levy war against the king. A riotous assembly attempting by force to do so or to inspire others to do so would, for example, to pull down all inclosures or to burn all meeting-houses, has been held to be a levying of war within the meaning of this clause, although there has been no direct intention or design whatever against the person or the person of the king. This construction is said to depend upon the generality of the design. If the intention be to pull down particular inclosures or meeting-houses only, the offence is a mere riot, and in quality a simple misdemeanour, although the possibility of design may be a reason for awarding a higher punishment in the former than in the latter case, there appears to be no foundation in reason or principle for construing an offence, which but for such generality would be a misdemeanour only, to amount to the crime of treason in levying war against the king. The Criminal Law Commissioners (4th, 5th, and 6th Reports) have recommended that this offence should no longer be considered to fall within the statute of treasons. They propose that the only assemblings or risings of the people which should amount to a levying of war against the king should be such as are against the person of the king, or against any army or forces appertaining to him, by the 12th section of his authority, or with intent to do him bodily harm, or impose any restraint upon his person, or to deprive him, or to dispossess or deprive him of any portion of his dominions or regal authority, or in any manner to force him to change his measures or counsels, or to put any forces or constraint upon or to intimidate or outrage both houses or either house of parliament; and that no assemblage or rising of the people should by reason of any illegality or generality of purpose be deemed to be a levying of war against the king, unless it be with one or other of the several intentions before mentioned. Such riotous and tumultuous meetings as have no such intention in view they recommend to be classed as misdemeanours or misdemeanors merely, according to the circumstances by which they are attended.

Again, the term 'praemunire' was originally applied to offences which consisted in the introduction of any foreign jurisdiction, more especially the authority of the See of Rome, into the kingdom; but has subsequently, to use the language of Mr. Benjamin Hawkins ('Plea of the Crown, b. 1, c. 19'), been applied to other heinous crimes, for the most part having relation to the offences originally coming under the notion of praemunire, but in some instances none at all. The Halaeus Corpus Act (31 Car. II. c. 12) contains an instance of the latter mode of application. By the 2nd section of that act it is made a praemunire to send any inhabitant of England, Wales, or the town of Berwick-upon-Tweed, a prisoner beyond the seas in defiance of its provisions to the contrary.

The term 'praemunire' was adopted from the first word of the original writ on which the subsequent proceedings were founded: 'praemunire' means to intromit or to introduce, and is corrupted from corum nobis, &c. [PRAEMUNIRE, P. C.]. The Criminal Law Commissioners propose to abolish praemunire as a class of crimes. (Seventh Report.)

The crime of felony had its origin in very remote times, and was founded upon feudal principles. Its incidents were not former, as they are now, of a merely arbitrary nature, peremptorily annexed to certain criminal acts without reference to rule or principle. The crime originally consisted in a violation of the feudal contract by the misconduct of the lord or of the tenant; and when committed by the tenant, occasioned a consequence forfeiture of his hold to the lord, (see Black Comm., p. 96; 4th and 7th Reps of Crim. Law Commrs.)

Those crimes, therefore, which induced such forfeiture, and, by a small deflection from the original sense, those which induced the forfeiture with intent, were classed as felonies, and afterwards, by long use the term felony came to signify the actual crime itself, and not the penal consequence. 'So that, upon the whole,' to use the words of Mr. Justice Blackstone (4 Com. Dig., tit. felony, p. 206), 'the denomination of felony seems to be that which is before laid down, viz. an offence which occurs a total forfeiture of either lands or goods, or both, at the common law; and to which capital or other punishment may be suppressed and the person acquitted of guilt. Where the punishment is less than capital, the offender loses his goods only; where capital, his lands as
well as his goods. The crimes which occasioned such forfei-
ture were originally, with one or two exceptions, capital; but at the present day there are offenses for which no greater punishment can be inflicted than imprisonment for a term not exceed-
ing fourteen years, and in those cases which are for offenses and con-
sequences the forfeiture of all the offender's goods and chattels; whilst other crimes, for which the punishment may be as high
as transportation for fourteen years, and in four instances must
be for life, are misdemeanors only, and work no forfeiture.
It is apparent from this that the present law is very defective, and
that the amount of punishment is no longer the test of dis-
tinction between a felony and misdemeanor. It is proposed by
the Committee on Criminal Law (Sec. Rep. p. 19) to remedy this by making the liability to transportation the test of
distinction, i.e. that all offenses liable to a less punishment
than transportation should be misdemeanors only.

The term 'Misdemeanor' is used in the English system
of Criminal Law to denote such indicable offenses as are of
a lower degree than felony.

We shall now point out the peculiarities of punishment
which distinguish one class of crimes from another at the pre-
sent day. In order to this, the penal consequences incident
the whole body of offenses constituting each class will be
first stated, and then in what respects those consequences dif-
fers from brother class. The classes will be taken in the same
order as above.

1. Treason. — Treason, with one exception mentioned
below, are capitally punished; but whether capital or not, the offender,
upon conviction is sentenced to the crown and personal
captors for every description, whether in action or possession, or settled
by way of trust, which the offender has otherwise than as an
executory (Cr. Car. 366), or a trustee, or a mortgagee (3 & 4 Wm. IV. 
c. 23, s. 9) as the case may be. In the case of captns, upon attaint by judgment of
death or outlawry, the blood of the offender is corrupted, but
not so as to obstruct descent to such offender's posterity, where
the offense is not a capital one, or is derived through such offender
to a remote ancestor (3 & 4 Wm. IV. c. 106, s. 10), and all the
freehold lands and tenements of inheritance in free-simple or
fee-tail, and all other hereditaments (except copholds), whatever
they be granted, by way of fee or grant; and all the
right of entry on freehold lands and tenements which the offender
has (other than as a trustee or mortgagee, 4 & 5 Wm. IV. c. 23, s. 9) at the time of the offense com-
mitted or at any time afterwards, and also the profits of all
freehold lands and tenements which the offender has in his or
her own right for life, so long as such interest shall subsist,
and, if the offender be a male, his wife's dowry, are forfeited
so. to the crown (4 Black Comm., 281; 30 Hen. VIL, c. 13,
5; 33 Hen. VIII, c. 20, s. 2; and 35 & 36 Edw. VI c. 11,
s. 9 and 13); and all the cophold estates belonging to the
offender at the time of the offense committed are forfeited to the
said crown (5 & 6 Judg. C. 1, s. 3). The above penal consequences are general to all capital
tresonors, unless, as is sometimes the case, the act which creates
the particular treason expressly exempts from some of them. The
latter is the case of a capital treason committed by the party guilty
of it to those only of the above consequences which accu-
rm upon conviction, since the others follow only upon the
party's being attained, that is, sentenced to death or out-
lawed, which latter, in the case of capital treasons and felonies,
is of the same effect as being sentenced to death. The
existence of this non-capital treason would appear to be the
result of inaccuracy. By the Forcroy Consolidation Act
(11 Geo. IV. & 1 Wm. IV. c. 81) it was declared to be
treson and punishable with death to forge the great and other
royal seals and the sign manual. By the 2 & 3 Wm. IV. 
c. 23, the punishments of death was repealed for forgery in all but the two cases of wills and powers of attorney to trans-
fer stock (it has been since taken away in those cases also by
the 7 Wm. IV. & 1 Vict. c. 84); but the quality of the
offenses enumerated in the Forcroy Consolidation Act was left
without alteration: so that to forge the royal seals, for
which appearance would appear to be still treason, though no longer a capital
offense.

The judgment of death in the case of treason is that the
offender, if a male, be drawn on a hurdle to the place of
execution, and be there hanged by the neck until dead; and
that afterwards the head be severed from the body of such of-

fender, and his body divided in four quarters, to be dis-
posed of as her Majesty shall think fit (4 Black Comm.,
p. 1499); and, if a female, that the offender be drawn to the place
of execution and be there hanged by the neck until dead
(30 Geo. III. c. 48, s. 1). The queen, however, may, by
warrant under her sign manual, countermanded by a principal
secretary of state, direct, where the offender is a male, that
he shall not be drawn, but taken in such manner as in the
word, or sent to the place of execution, and he shall not be hanged, but be beheld, whilst alive, instead
(54 Geo. III. c. 146, s. 2).

2. Precumaries. — The penalties of preumaries, as shown
summed up by Sir Edward Coke (1 Inst. 190 a), are, 'that
from the conviction the defendant shall be out of the king's
protection, and his lands and tenements (i.e. in fee-simple or
for life, but not in tail beyond his life interest therein),
and goods and chattels, are forfeited;' and that his body shall
remain in prison at the king's pleasure, or, as other au-
thorities have it, during life. These penalties were first im-
posed by the stat. 16 Rich. II, c. 5 (commonly called the
Statute of P r e u m a r i e s ); and it is by reference to that statute
that all subsequent preumaries have been made punishable.
It was formerly supposed that a person convicted of preumary,
being put to death under the king's protection, might be
killed with impunity, as being the king's enemy; but by the 5 Eliz. c.
ss. 21 and 22, it was enacted that it should not be lawful to
kill any person attainted in a preumary, saving such parts of
death or other hurt or punishment as theretofore might, with
put to death, be done upon us, and save our man and
to the realm, &c. any process, &c. from the See of Rome.
Preumaries, although they occasion a forfeiture of the
offender's lands and goods, are not felonies. To constitute a
forfeiture of moveables, the offense must be of a higher law;
but in case of preumary the forfeiture is made as a
part of the punishment by statute merely, which is not suf-
cient (4 Black Comm., pp. 94 and 118.)

3. Felonies. — The felonies, with one or two exceptions,
were originally, with one or two exceptions, punishable with death; but the
offender, unless the felony was excluded from the benefit of
clergy, was entitled, for a first offender, to be discharged from the
capital punishment upon paying a fine in the discretion of
that person (13 & 14 Geo. I. c. 82, s. 3). But now, since the passing of the 7 & 8 Geo. IV. c. 28,
it is not punishable with death unless it was excluded from the
benefit of clergy before or on the 14 Nov. 1828, or has been
punished or imprisoned for the same offense; all others being
tied to the realm, &c. any process, &c. from the See of Rome.
Any sentence of death in a capital offense is suspended for
seven years, or imprisonment for any term not exceeding
two years, with the addition, if the court shall think it, of whipping, where the offender is a male, hard
labour and solitary confinement, or any of them. (7 & 8 Geo. IV. c. 28, ss. 7 and 8.) Such confinement must not
however be for a longer period than one month at a time, or
three months in a year. (7 Wm. IV. & 1 Vict. c. 90, s. 5.)

In the case of conspiracy, under the Statute of Treason (7 
Wm. IV. c. 23, s. 3), at the time of conviction (Bac. Abrid.,
"Forfeiture" (I) ; Co-Litt. 391 a); and in the case of all
capital felonies, upon attaint by judgment of death or
forfeiture, forfeits to the crown the profits of all estates of

capital felonies (4 Black Comm., 355), and of things not lying in
tenure (Bac. Abrid., "Forfeiture" (A)), and to the lord of the
manor the profits if all estates of any cophold (Hawk.
P.C. b. 2, c. 49, s. 7; Lord Campbell's case, 2 Vett.
38-9), which the offender has, otherwise than as a trustee or
mortgagee (4 & 5 Will. IV. c. 23, s. 3), at the time of the
offense committed, during his life; and his blood is corrupted
(but not so as to obstruct descent to the posterity of such
offender where they are obliged to derive a title through him
to a remote ancestor (3 & 4 Will. IV. c. 106, s. 10), and
after his death his copholds which he holds in fee-simple are
forfeited to the lord (Coke on Copholds, 523, note d.) And also in the case of murder, all his
freehold lands and tenements in fee-simple escheat (subject to
what is called the crown's day, day and waste) to the lord of the
lost (7 Geo. III. c. 146; Co-Litt. 391 a; 4 Black Comm.
355.)

The judgment of death in the case of all capital felonies, except murder, is that the offender be hanged by the
neck until dead; and, if a male, drawn on a hurdle to
the place of execution, and be there hanged by the neck until
death, and, if a female, that the offender be drawn to the
place of execution and be there hanged by the neck until
death (4 Black Comm., 355).
have been confined after conviction. (2 & 3 Will. IV. c. 75, s. 18; & 4 & 5 Will. IV. c. 95.) The court however is empowered, if it shall think that the offender is a fit subject to be recommended to the royal mercy, to abstain from pronouncing judgment of death upon him, and to order such judgment to be entered of record instead; and the judgment so ordered has the same effects as the conviction which produced the punishment were reprimed. (4 Geo. IV. c. 48, ss. 1 & 2; & 6 & 7 Will. IV. c. 90, s. 2.)

4. Misdemeanors.—The punishment in the case of misdemeanors is, more immediately, decided by the court, and not by a statute, that has been specially provided by statute, is generally fine and imprisonment.

From what has been stated, it will be seen that the circumstances of the offense are the determining circumstances of the sentence—distinguishing misdemeanors from all other classes of offenses, is the absence of forfeiture as a necessary consequence of conviction. The distinction between misdemeanors and felonies (which term, it should be remarked, in its largest sense, includes treasons, on account of the forfeiture which that class of crimes occasions) is, that the forfeiture which ensues upon a conviction of the former is, as before observed, in pursuance of statutory provisions; whereas in the latter case it is a common law consequence of the offense, and follows as a matter of course whenever a crime is declared to be a felony. There appears to be no distinction as regards punishment, in the case of a no less a crime, than an act not only small in amount, but even a single act, as theft or false imprisonment of a person committed on the highway.

The law of felony is a great code, and the difference between felonies and treasons is not one which is readily distinguished. The court, in determining the degree of such offenses as false imprisonment, on account of, and upon, upon, forfeits to the crown the profits of such freehold and copyhold lands as he had at the time of committing the offense, during his life, and after his death, his copyholds in fee-simple are forfeited to the lord of the manor, and even when attainted of murder, though his freehold estates in fee-simple fall after his death, it is not as a consequence of the law of forfeiture, but because they escheat for want of heirs capable of enjoyment, as his blood being corrupted by the attainer; and it is on account of such estates escheatting and not being forfeited that they go to the lord of the fee (that is, subject to the crown's year, day and waste), and not to the crown, unless there appears to be no intermediate lord between the offender and the crown, in which event the crown takes as ultimate lord of the fee. In the case of treason, however, the offender upon attainer, instead of forfeiting to the crown the profits merely of such freehold lands as he had at the time of committing the offense, during his life, forfeits all freehold estates of inheritance, as well those in fee-tail as those in fee-simple, and not only such as he had at the time of the commission of the offense, but those also which he may acquire at any time afterwards; and instead of forfeiting to the crown the profits of his copyhold during his life, and to the lord of the manor his copyhold in fee-simple for the life of the copyholder, and instead of paying to the crown the profits of the manor all the copyholds belonging to him at the time the offense was committed. Where the offender is a male, his wife's dowry is also forfeited to the crown, which is not the case in the case of a female. The law of treason has now empowered (see 59 Geo. III. c. 94) to restore the whole or any part of any lands or hereditaments to which it becomes entitled by escheat or forfeiture to the family of the offender, a provision which has greatly mitigated the harshness of the law of forfeiture. The Criminal Law Commissioners however recommend the entire abolition of the confiscation of property as a necessary incident to convictions for treason or felony. (Seventh Report on Criminal Law.) The difference between the judgment of death for treason and that for felony requires no comment.

As to the peculiarities of punishment, those different classes of offenses are distinguished by particular forms of procedure; but it will be more convenient to refer to these when describing our general system of criminal procedure.

The law of England, in grouping under one or the other of the various classes into which indictable crimes are divisible by the law of England, it is now proposed to state shortly what are the different offenses comprised under each of those classes. In this belonging to each of those classes, and who are under their several punishments. The classes are taken in the same order as before. It will be proper, however, in the first instance, to show what persons are capable of committing crimes, to notice one or two provisions of general application, for the purpose of preventing repetition, and to make a few explanatory observations.

According to the law of England, all persons above the age of seven years, except such as by reason of unripeness, weakness, insensibility, disease or delusion of mind, are incapable of discerning, at the time they do an act, that the act is contrary either to the law of God or the law of the land, are criminally responsible for such act; but temporary incapacity willfully induced by intoxication or other means to excuse. An infant of the age of seven and under fourteen years, however, is to be presumed to be incapable of committing a crime until the contrary be proved. Duress, also, inducing a well-grounded fear of injury or death, will excuse a person acting under such stresses in all cases except treason and murder; and a married woman committing any offense, except those last mentioned, if her husband be present at the time, shall be presumed to have acted under his coercion, and be entitled to an acquittal, unless it appear that she did not so act. A married woman also shall not be liable to conviction for receiving her husband or any other person in his presence and by his authority.

The following provisions are of general application. By the statute 7 Will. IV. & 1 Vict. c. 90, s. 5, it is enacted that no court shall direct any sentence of imprisonment for a term of six months or more, in any case of confinement for any longer period than one month at a time or three months in the space of one year. Whenever, therefore, in the following statement solitary confinement is mentioned as part of the sentence of punishment for any offense, the periods during which it may be inflicted are to be understood as regulated by the above provision.

By the statute 7 Will. IV. & 1 Vict. c. 85, s. 11, power is given to the jury on the trial of any person for any felony whatsoever, where the crime charged shall include an assault against the person, to acquit the felony, and to find a verdict of guilty of assault against the person indicted, if the evidence shall warrants such finding; and thereafter the court may imprison the person so found guilty of an assault for any term not exceeding three years, with or without hard labour or solitary confinement, or with both.

By the statute 1 Geo. IV. c. 57, s. 3, it is provided that where the punishment of whipping on female offenders formed, before the passing of that act, the whole or part of the sentence to be pronounced, the court may pass sentence of confinement to hard labour for any time not exceeding six months nor less than one month, or of solitary confinement, in lieu of the sentence of being whipped. In all cases, therefore, where whipping is mentioned to be part of the punishment, with its being restricted to males, the above provision operates.

By the statute 3 & 4 Vict. c. 111, made perpetual by 5 & 6 Vict. c. 65, members of joint-stock or other banking companies, who, consisting of more than six persons, are charged with, or with intent to injure or defraud such co-partnerships, are made liable to the same punishments as if they had not been or were not members of such co-partnerships.

In the case of assault, a sentence of transportation only is given of any particular offence. It is to be observed, however, that where a crime is defined by statute, the enactment in most cases comprehe, in fact, many other offenses distinct from the general one, though in nature connected with it. For the details of such enactments, reference must be made to the statutes cited at the end of each offense. With respect to these statutes, those which define the crime, as well as those which declare the punishment, are referred to where ever the statutes are distinct, and these are arranged as regards any particular crime in the order of date; and generally, where there is no intent on the part of the criminal to injure any act of, or in the course of, such acts have been primarily separately from the public general acts.

I. TREASON.—(Capital.)

The following treasons are punishable with death; viz.:—1. Compassing or abetting the death of the king, or of a queen regnant, or of his queen, or of their eldest son and heir;
violating the king's companion, (4. e. his wife during the coverture,) or the king's eldest daughter unmarried, or the wife of the king's eldest son and heir; levying war against the king in his realm, or being adherent to the king's enemies in his realm, giving them aid and comfort in the realm or elsewhere, and being thereof attainted of open deed; or slaying the chancellor, treasurer, or the king's justices of the one bench or the other; justices in eyre or justices of assize, or any other justices assigned to hear and determine, being absent in their places doing their offices. (25 Edw. III. st. 5. c. 2.)

2. Endeavouring to prevent the person next in succession to the crown, according to the Acts of Settlement, from succeeding thereto, (1 Anne. st. 3. c. 17. s. 3.)

3. Affirming, by writing or printing, that any other person has a right to the crown otherwise than according to the Acts of Settlement and the Acts for the Union of England and Scotland; or that the crown, with the authority of parliament, is unable to limit the descent of the crown. (6 Anne. c. 7. s. 1.)

4. Compeising or intending the death or destruction, or any bodily harm tending to death or destruction, or any wounding, imprisonment or restraint of the person of the king; or to deprive or depose him from the crown; or to levy war against him, within the realm, in order to compel him to change his measures or counsels, or in order to overthrow the parliament; or to move any foreigner to invade any of the British dominions; such compising or intention being expressed by publishing some printing or writing, or by some overt and visible act. (2 Geo. III. c. 7. s. 1. made perpetual by 57 Geo. III. c. 6.)

5. Being married to, or being concerned in procuring the marriage of any issue of her present majesty whilst such issue are under age, or in the crown or have descended to any such before that age), without the consent in writing of the regent and the assent of both Houses of Parliament. (5 & 4 Vict. c. 52. s. 4.)

6. Giving any person to have committed any of the before-mentioned capital treasons, receiving, relieving, comforting or assisting him, or aiding his escape from custody.

7. Bringing into the realm papal bulls or other writings or instruments from the See of Rome; or publishing or writing or in use any such bulls, writings or instruments. (18 Eliz. c. 2. s. 2 and 3.)

Besides the last-mentioned offence, there also existed till very recently several other capital treasons relating to the See of Rome; but these were repealed by the 7 & 8 Vict. c. 102.

Traiter.—(Non-Capital.)

The following treason (the one already alluded to) is punishable with transportation for life or not less than seven years, or with whipping for any term not exceeding one year, or with or without hard labour or solitary confinement, or with both; viz—

1. Forgery of the great seal, her majesty's privy seal, any privy seal of the realm, the royal sign manual, the seals appointed to be used in Scotland, and the great and privy seals of Ireland. (11 Geo. IV. & 1 Wm. IV. c. 66. s. 2; 2 & 3 Wm. IV. c. 123; 3 & 4 Wm. IV. c. 44. s. 3; 7 Wm. IV. & 1 Vict. c. 84. ss. 2 and 3.)

11. Premises.

The following are the offences coming under this denomination still in force:

1. Derogating from the queen's courts. (27 Edw. III. st. 1. c. 1. s. 1.)

2. Deeds and charters omitting to elect a bishop; and archbishops or bishops to consecrate the person so elected after receiving the queen's congé d'élire. (25 Hen. VIII. c. 20. s. 7; repealed by 1 & 2 Philip and Mary, c. 8, and revised by 3 & 4 Phi. c. 5.)

3. Molossing the possessors of abbey lands contrary to the provisions of 1 & 2 Philip and Mary, c. 8. (1 & 2 Phi. and Mary, c. 8. s. 40.)

4. Obtaining any stay of proceedings, other than by arrest of judgment or writ of quo warranto, in mulct or monopo. (21 Jac. I. c. 8. s. 4.)

* By the 11 Hen. VII. c. 1, it is enacted that no person who attends upon the king or queen, or attends upon the queen for the true being, in his person, and does him true and faithful service of allegiance in all things belongeth to his person or his estates, in this land or without, shall for such deed and true allegiance be convicted or attainted of treason.

* The repeal of this offence is recommended by the Commissioners for revising the Criminal Law, in Their Report on Peace, War, and Disabilities in regard to Religious Opinions, dated the 20th May, 1848.

5. Procuring any stay of proceedings, other than by the authority of the court, in actions brought against persons for making provision or purveyance for the crown. (12 Car. III. c. 24, s. 14.)

6. Assembling maliciously and advisedly, by speaking or writing, that both Houses or either House of Parliament has a legislative authority without the crown. (18 Car. II. c. 1, s. 3.)

7. Sending any subject of the realm a prisoner beyond the seas in defiance of the Habeas Corpus Act. (31 Car. II. c. 9. s. 12.)

8. Asserting, maliciously and directly, by preaching, teaching or maintaining, that any act according to the Acts of Settlement and Union, has any right to the throne of these kingdoms, or that the queen and parliament cannot make laws to limit the descent of the crown. (6 Anne. c. 7. s. 2.)

9. Knowingly and wilfully solemnizing, assisting or being present at, any marriage forbidden by the Royal Marriage Act. (12 Geo. III. c. 11. s. 3.)

10. Aiding, comforting or maintaining persons who bring into the realm papal bulls or other writings or instruments from the See of Rome, to the intent to uphold the jurisdiction or authority of the pope. (13 Eliz. c. 2. s. 4.)

III. Felonies.—(Capital.)

The following felonies are punishable with death, viz—

1. Destroying ships of war or her majesty's arsenals, dockyards, magazines, storehouses or victualling, or other ammunition of war, &c. (12 Geo. III. c. 24. s. 1.)

2. Murder. (9 Geo. IV. c. 81. s. 3.)

3. Unnatural offences. (9 Geo. IV. c. 81. s. 15.)

4. Aiding, or procuring the taking of a person, by ouing or by wounding, or by any other means whereby bodily injury dangerous to life is caused. (7 Wm. IV. & 1 Vict. c. 85. s. 2.)

5. Burnary, aggravated by striking an inmate. (7 Wm. IV. & 1 Vict. c. 85. s. 2.)

6. Robbery, aggravated by wounding the person robbed. (7 Wm. IV. & 1 Vict. c. 87. s. 2.)

7. Piracy, aggravated by endangering the life of any person on board. (16 Geo. IV. c. 80. s. 3.)

8. Setting fire to a dwelling-house, any person being therein. (7 Wm. IV. & 1 Vict. c. 89. s. 2.)

9. Destroying vessels with intent to murder, or whereby human life is endangered. (7 Wm. IV. & 1 Vict. c. 89. s. 4.)

10. Exhibiting false lights, &c. with intent to bring ships into danger, or unlawfully doing anything tending to the destruction of ships in distress. (7 Wm. IV. & 1 Vict. c. 89. s. 5.)

Besides the above offences, that of wilfully and without lawful cause having or being possessed of any forged stamp used in pursuance of any Act relating to any duties on gold or silver plate made or wrought in Great Britain, for the purpose of marking or stamping such plate, appears to be still punishable with death.

That offence is contained in 56 Geo. III. c. 185. s. 7, by virtue of which enactment it was formerly also a capital crime to forge or utter the stamps provided for marking any such plate, or to fraudulently remove such stamps from one piece of such plate to another, or privately or secretly to use such stamps with intent to defraud the king. The punishment of death for these last-mentioned offences was repealed, however, by 11 Geo. IV. & 1 Wm. IV. c. 66. s. 1 (as to the forging and uttering), and by 4 & 5 Vict. c. 56. s. 1 (as to the removing and fraudulently using); but by some inaccuracy (for it is clear that it can never have been intended) the offence of being possessed, without lawful excuse, of forged stamps for marking gold or silver plate (the least criminal of all the acts specified in 56 Geo. III. c. 185. s. 7) is still left capital.

There are two other enactments of capital offence which do not seem to have been wholly repealed, either expressly or by implication. The Criminal Law Commissioners (7th Report) say, 'Although many Acts have been passed which punish prison-brush by penalties not capital, yet these seem to be still sufficiently severe to render particular grises and prisons, and not to
affect the general enactments above referred to, as regards officers against their provisions confined in other prisons.  

(Non-Capital.)  

Non-capital felonies are punishable as follows, viz., with  
1. Transportation for life, and previously thereto imprisonments, &c., with or without hard labour, for any term not exceeding four years.  
2. Offenders transported from Great Britain being found at large, without some lawful excuse, before the expiration of their term of transportation. (5 Geo. IV. c. 84, s. 92; 4 & 5 Wm. IV. c. 67.)  

II. Transportation for life.  
1. Rape. (9 Geo. IV. c. 31, s. 16; 4 & 5 Vict. c. 56, s. 5.)  
2. Carnally knowing and abusing girls under ten years of age. (9 Geo. IV. c. 31, s. 17; 4 & 5 Vict. c. 56, s. 8.)  
3. Forgery of the name or handwriting of the Receiver-General of Prisons, or of the Comptroller-General of Customs, &c., to any draft, &c., on the Bank. (8 & 9 Vict. c. 85, s. 36.)  

III. Transportation for life, or not less than fifteen years, or imprisonment for any term not exceeding three years, with or without hard labour or solitary confinement, or with both.  
1. Piracy. (28 Hen. VIII. c. 15; 11 & 12 Wm. III. c. 3, s. 8, 9, and 10; 4 Geo. I. c. 11, s. 7; 6 Geo. I. c. 19; 8 Geo. I. c. 34; 12 Geo. III. c. 56, s. 7; 18 Geo. I. c. 25; 7 Wm. IV. & 1 Vict. c. 61, s. 3.)  
2. Offences against the Riot Act.* (1 Geo. I. s. 2, c. 5, ss. 1 and 5; 7 Wm. IV. & 1 Vict. c. 91, ss. 1 and 2.)  
3. Rescuing a runner out of prison, or whilst going to or during transportation. (25 Geo. II. c. 87, ss. 9, 10; 7 Wm. IV. & 1 Vict. c. 91, ss. 1 and 2.)  
4. Seducing sailors or soldiers from their allegiance, or inducing them to desert. (57 Geo. III. c. 70, s. 1; 57 Geo. III. c. 7; 7 Wm. IV. & 1 Vict. c. 61, ss. 1 and 2.)  
5. Administering oaths binding any person to commit treason or any capital felony. (32 Geo. III. c. 104, s. 1; 7 Wm. IV. & 1 Vict. c. 91, ss. 1 and 2.)  
6. Any subject of her majesty, or any person residing in any of the queen's dominions, or in any place under the government of the East India Company, or upon the high seas, or within the Admiralty jurisdiction, carrying away any persons to make slaves of them. (5 Geo. IV. c. 112, s. 9; 3 & 4 Wm. IV. c. 73; 7 Wm. IV. & 1 Vict. c. 91, ss. 1 and 2.)  
7. Assembling armed, to the number of three or more, for the purposes of smuggling. (7 Wm. IV. & 1 Vict. c. 91, ss. 1 and 2; 8 & 9 Vict. c. 87, s. 63.)  
8. Shooting at vessels belonging to the navy or in the revenue officers, &c., employed in the prevention of smuggling. (7 Wm. IV. & 1 Vict. c. 91, ss. 1 and 2; 8 & 9 Vict. c. 87, s. 64.)  
9. Attempts to aid or abet, by attempting to administer poison, or by shooting at or attempting to drown, suffocate, or strangle any person, although no bodily injury be effected. (7 Wm. IV. & 1 Vict. c. 85, ss. 3 and 5.)  
10. Attempting to discharge any kind of loaded arms at or wounding any person, with intent to do grievous bodily harm to such person, or to prevent lawful apprehension or detention. (7 Wm. IV. & 1 Vict. c. 85, ss. 4 and 8.)  
11. Sending explosive substances, &c., to any person, or throwing any corrosive fluid or other destructive matter upon any person, with intent to do grievous bodily harm, and whereby grievous bodily harm is done to any person. (7 Wm. IV. & 1 Vict. c. 85, ss. 5 and 9.)  
12. Attempting to procure the miscarriage of women. (7 Wm. IV. & 1 Vict. c. 85, ss. 6 and 8.)  
13. Robbery, aggravated by the offender being armed, by numbers, or by the use of personal violence to the person robbed. (7 Wm. IV. & 1 Vict. c. 87, ss. 3 and 10.)  
14. Extorting property by threatening to accuse of unnatural generation, &c., with intent to extort any money. (7 Wm. IV. & 1 Vict. c. 87, ss. 4 and 10.)  
15. Setting fire to places of worship or houses, or to buildings or erections used for the purposes of trade, with intent to injure or defraud any person. (7 Wm. IV. & 1 Vict. c. 89, ss. 1 and 2.)  
16. Setting fire to or otherwise destroying vessels, with intent to prejudice any person interested therein or in the goods on board the same, as an owner, part owner or underwriter. (7 Wm. IV. & 1 Vict. c. 89, ss. 6 and 12.)  
17. Forcibly recovering a person, &c., in order to save his life from a vessel in distress or wrecked. (7 Wm. IV. & 1 Vict. c. 89, ss. 7 and 12.)  
18. Setting fire to coal-mines. (7 Wm. IV. & 1 Vict. c. 89, ss. 9 and 12.)  
19. Setting fire to stacks of corn, grain, coal or wood, &c., or to any stook of wool. (7 Wm. IV. & 1 Vict. c. 89, ss. 10 and 12.)  
20. Transportation for life, or not less than fifteen years, or imprisonment for any term not exceeding three years.  
1. Setting fire to farm buildings, or to buildings or erections used in farming land; or for the purpose of setting fire to such farm-buildings, or to any fire to farm produce or implements being therein, with intent in any such case to injure or defraud any person.* (7 & 8 Vict. c. 62, ss. 1 and 2.)  
2. Forgery of the name or handwriting of any person so entitled, or of any officer or servant of Chelsea Hospital, &c., or any writing concerning the payment of any such prize-money, &c. (2 Wm. IV. c. 53, s. 49.)  
3. Transportation for life or for any term of years.  
1. Taking or attempting to take (being compelled thereto) binding the person taking the same to commit treason or any capital felony. (93 Geo. III. 104, s. 4.)  
2. Personating soldiers or other persons entitled to pensions, &c., on account of military services, or their representatives; or  
3. Forgery of the name or handwriting of any person so entitled, or of any officer or servant of Chelsea Hospital, &c., or any writing concerning the payment of any such pensions, &c. (7 Geo. IV. c. 16, s. 38.)  

VIII. Transportation for life or for fourteen or seven years.  
1. Aiding the escape of prisoners of war from prison or from the queen's dominions, if at large upon parole. (52 Geo. III. c. 156, s. 1.)  
2. Subjects of her majesty sitting, upon the high seas, the escape of prisoners of war after they have quitted the coast. (52 Geo. III. c. 156, s. 8.)  

IX. Transportation for life or not less than seven years, or imprisonment for any term not exceeding seven years, with or without hard labour or solitary confinement.  
1. Stealing or embezzling her majesty's ammunition, naval or military stores. (4 Geo. IV. c. 55; 7 & 8 Geo. IV. c. 27.)  
2. Sending letters threatening to kill any person, or to burn his house, &c.; or rescuing a person in custody for any such offence. (4 Geo. IV. c. 54, s. 3; 7 & 8 Geo. IV. c. 27.)  
3. Bankrupt not surrendering, or not discovering all his estate, or embezzling or concealing any part thereof to the amount of 10l. or upwards, &c. (5 & 6 Vict. c. 122, ss. 32 and 33.)  
4. Transportation for life or not less than seven years, or imprisonment for any term not exceeding four nor less than two years, with or without hard labour or solitary confinement, or with both.  
1. Forgery of the seal or bonds of the South Sea Company (6 Geo. I. c. 4, s. 56; 11 Geo. IV. & 1 Wm. IV. c. 66, ss. 1 and 26); of receipts or warrants of the South Sea Company (6 Geo. I. c. 11, s. 50; 11 Geo. IV. & 1 Wm. IV. c. 66, s. 4; 2 & 3 Wm. IV. c. 129; 3 & 4 Wm. IV. c. 64, s. 3; 7 Wm. IV. & 1 Vict. c. 84, ss. 2 and 3); of seals, policies, &c., of the London and Royal Exchange Assurance Companies (6 Geo. I. c. 18, s. 15; 11 Geo. IV. & 1 Wm. IV. c. 66, ss. 1 and 4; 4 & 5 Wm. IV. c. 122, s. 1); of the seal of the Commissioner of the Accountant-General, Registrar, or Clerk of the Report Office (of the Court of Chancery), or of any cashier of the Bank, to any instrument relating to the sailors' money or
bank-notes, bills of exchange, promissory notes and warrants, or orders for the payment of money (11 Geo. IV. & 1 Wm. IV. c. 66, s. 3; 2 & 3 Wm. IV. c. 123, s. 1; 3 & 4 Wm. IV. c. 44, s. 3; & 5 & 6 Wm. IV. c. 44, s. 3, 7 & 8 Wm. IV. c. 123, s. 2; & 1 Vict. c. 84, s. 2 and 3); of deeds, bonds, court-rolls, receipts for money or goods, or accountable receipts, or orders for the delivery of goods (11 Geo. IV. & 1 Wm. IV. c. 66, s. 9); of entries in registers of marriages hereafter or herebefore to be kept by the officiating minister of the parish, &c.; or of marriage licences (11 Geo. IV. & 1 Wm. IV. c. 66, s. 20 in part; 6 & 7 Wm. IV. c. 80, ss. 43 and 49); of wills and other testamentary writings, and of powers of attorney to transfer any public stock transferable at the Banks of England or Ireland or the South-Sea Bank, or to receive any dividend in respect of any such stock (11 Geo. IV. & 1 Wm. IV. c. 66, ss. 3 and 6; & 3 Wm. IV. c. 123, s. 2; 7 Wm. IV. & 1 Vict. c. 84, ss. 1 and 3); of certificates, &c. of the commissioners for granting relief to the Irish Guiltain, Loop, and the island of Dominica (2 & 3 Wm. IV. c. 125, s. 65; & 6 & 7 Wm. IV. c. 51; 7 Wm. IV. & 1 Vict. c. 84, s. 1 and 3); of receipts or certificates of the Slave-Compensation Commissioners (5 & 6 Wm. IV. c. 45, s. 12); of receipts or certificates for the sum of four millions for funding Exchequer-bills (2 & 3 Vict. c. 97, s. 32).

2. Offending a third time in uttering counterfeit gold or silver coin not permitted to be current within this realm. (37 Geo. III. c. 126, s. 4; 11 Geo. IV. & 1 Wm. IV. c. 66, ss. 1 and 26.)

3. Denying a seaman or mariner, or other persons entitled to any allowance from the Compagnonate Fund of the navy, in order to receive their pay or prize-money, or allowance from the Compagnonate Fund. (11 Geo. IV. & 1 Wm. IV. c. 20, s. 9; 1 Vict. c. 84, ss. 1 and 26.)

4. Taking false oath in order to obtain probate of the will or administration of the effects of deceased seamen or mariners, or demanding their pay or prize-money by virtue of such will or administration, &c. (11 Geo. IV. & 1 Wm. IV. c. 20, ss. 88 and 89.)

5. Making false entries in the books of the Bank, or of the South Sea Company, or making transfers of stock transferable at either of those places, in the names of persons not being the true owners thereof. (11 Geo. IV. & 1 Wm. IV. c. 66, s. 5; 2 & 3 Wm. IV. c. 123, s. 1; 3 & 4 Wm. IV. c. 44, s. 3; 7 Wm. IV. & 1 Vict. c. 84, ss. 2 and 3.)

6. Partaking of any stock or of the capital stock of the Bank of England, or of the South Sea Company, or of the capital stock of any corporate body, &c. established by charter or act of parliament, or of any dividend payable in respect of such stock, and thereby transferring or endeavouring to transfer the same to any other person, in order to receive such dividend. (11 Geo. IV. & 1 Wm. IV. c. 66, ss. 16, 17, 18, and 19; 2 & 3 Wm. IV. c. 123, s. 1; 3 & 4 Wm. IV. c. 44, s. 3; 7 Wm. IV. & 1 Vict. c. 84, ss. 2 and 3.)

7. Acknowledging any recognition or bail, cognizant action, judgment, or deed to be enrolled, in the name of any person not privy thereto. (11 Geo. IV. & 1 Wm. IV. c. 66, s. 11.)

8. Destroying or injuring registers of marriages heretofore kept, or registers of baptisms or burials heretofore or hereafter to be kept by the officiating minister of the parish, &c. (11 Geo. IV. & 1 Wm. IV. c. 66, s. 20 in part; 6 & 7 Wm. IV. c. 86, ss. 43 and 49.)

9. Officers of the Bank or South Sea Company secret- ing, embellishing, or running away with securities or effects. (15 Geo. IV. c. 10, s. 15; 24 Geo. IV. c. 11, s. 15; 18 Geo. IV. c. 66, s. 6; 37 Geo. IV. c. 46, s. 8, & 5 Vict. c. 66, s. 1.)

provisions, powers, privileges, advantages, penalties, forfeitures, and disabilities, above mentioned, still remaining, are to be considered as a body of laws of the same name, in the manner of the statue of grants on Bank, parchment, or paper. See Lord Advocate's "Statute Criminal Law," p. 61, note (c); the language of the Act has been reproduced on a large scale, with the exception of the

* As to the forgery of stamps on newspapers, the 6 & 7 Wm. IV. c. 76, s. 1, appears to make it an offence punishable under 10 Geo. IV. c. 114, s. 3, & c. 12 Geo. IV. c. 50, s. 2. Also, as to certificates relating to the duties of excise, see 41 Geo. III. (U. K.), c. 3.

** The 52 Geo. III. c. 142, s. 10, appears to be repealed, so far as relates to the Customs and Excise, for by 17 Geo. IV. c. 54, s. 3, &c. 38 Geo. IV. c. 18, and 47 & 48 Wm. IV. c. 44, &c. 6 & 7 Wm. IV. c. 44, s. 7, &c. 7 Wm. IV. & 1 Vict. c. 84, ss. 3 and 9, of stamps upon relating to the duties of the Excise (5 Geo. IV. c. 25, s. 15; 11 Geo. IV. & 1 Wm. IV. c. 66, ss. 1 and 26); of certificates, &c. as to donations granted by the commissioners for the reduction of the national debt, or of instruments made by them relating thereto (10 Geo. IV. c. 54, s. 41; 11 Geo. IV. & 1 Wm. IV. c. 66, ss. 1 and 26; 2 & 3 Wm. IV. c. 59, s. 19; 7 Wm. IV. & 1 Vict. c. 84, ss. 1 and 3); of certificates and other documents in order to obtain pay or prize-money, drawn in respect of services performed by any person in the navy (11 Geo. IV. & 1 Wm. IV. c. 120, ss. 83 and 88; 2 Wm. IV. c. 40, s. 35); of Exchequer-bills, &c. Exchequer debentures, East-India bonds.
10. Privately or secretly using stamps provided in pursuance of any Stamp Act, with intent to defraud her Majesty of any duties granted by such act. (22 Geo III. c. 184, s. 7; 55 Geo III. c. 185, s. 7; 9 Geo IV. c. 18, s. 35; & 5 & 6 Geo V. c. 65, s. 1 & 4.)

11. Fraudulently tearing off or removing stamps from vellum, parchment, paper, gold or silver plate, &c., with intent to use them again. (55 Geo III. c. 184, s. 7; c. 185, s. 7 & 4.)

12. Offenders transported from St. Helena coming into England before the expiration of their term of transportation. (6 Geo IV. c. 65, s. 18; 4 & 5 Vic. c. 56, ss. 1 and 4.)

13. Library of a stamp office; or stamp works; or buildings connected with trade or the business of mines. (7 & 8 Geo IV. c. 8, s. 8; 4 & 5 Vic. c. 56, ss. 1 and 4; & 6 & 7 Vic. c. 10.)

14. Transportation for life or not less than seven years, or imprisonment for any term not exceeding four nor less than two years.

1. Being possessed, without lawful excuse, of forged dies, &c., or of any vellum, parchment, or paper having thereon the impression of any forged die, &c., or fraudulently using any stamp which shall have been removed from any other vellum, &c.; or getting out of or from any vellum, &c., any matter therein expressed, with intent to use the stamp then being thereon, for any instrument or thing liable to stamp duty, &c. (3 & 4 & 5 Wm IV. c. 97, ss. 11 and 12; 4 & 5 Wm IV. c. 60.)

2. Forgery of any of the stamps; or privately or fraudulently using such stamps, or, without lawful excuse, being possessed of any paper or other material so privately or fraudulently stamped. (3 & 4 & 5 Vic. c. 96, s. 32.)

3. Destroying or damaging goods of silk, woolen, linen, or cotton, &c., whilst in progress of manufacture, or any machine or implement used therein, or forcibly entering any place to commit any of those offences. (7 & 8 Geo IV. c. 30, ss. 3 and 27.)

4. Breaking down sea-banks, &c., whereby any land shall be in danger of being overflowed or damaged; or destroying works on navigable rivers or canals. (7 & 8 Geo IV. c. 98, ss. 12 and 27.)

5. Destroying, &c., public bridges. (7 & 8 Geo IV. c. 98, ss. 13 and 27.)

6. Transportation for life or not less than seven years, or imprisonment not exceeding four years, with or without hard labour or solitary confinement, or with both.  

1. Counterfeiting the queen's current gold or silver coin. (2 Wm IV. c. 84, ss. 3 and 19.)

2. Gilding or silvering or colouring counterfeit coin, or any pieces of metal, with intent to make them pass for the queen's current gold or silver coin; or colouring or altering genuine coin, with intent to make it pass for a higher coin. (2 Wm IV. c. 84, ss. 3 and 19.)

3. Buying, &c., or putting off, &c., at a lower value than the same by its denomination imports, or importing into the kingdom or exporting out of the kingdom any coin intended to pass for the queen's current gold or silver coin, knowing the same to be counterfeit. (2 Wm IV. c. 84, ss. 3 and 19.)

4. Having been convicted of uttering counterfeit coin intended to pass for the queen's current gold or silver coin, &c., or having been convicted of uttering such coin, and being possessed at the time of such uttering of more such coin, or having, on the same day or within ten days afterwards, uttered more such coin, &c., afflicting any of such offences. (2 Wm IV. c. 84, ss. 3 and 19.)

5. Having been convicted of having in possession three or more pieces of counterfeit coin intended to pass for the queen's current gold or silver coin, with intent to utter the same, &c., afterwards committing the like offence. (2 Wm IV. c. 94, ss. 18 in part and 19.)

6. Without lawful authority, making, buying or selling, or having in possession, &c., any instrument adapted for counterfeiting the queen's current gold or silver coin. (2 Wm IV. c. 94, ss. 10 and 19.)

7. Without lawful authority, conveying out of the Mint instruments of coining, or any coin, bullion, &c. (2 Wm IV. c. 94, ss. 11 and 19.)

8. Persons employed under the Post Office stamping, embossing, secretarial or other business connected with the Mint or coining, &c. (7 Wm IV. & 1 Vic. c. 36, ss. 26, 41, 42.)

9. Stealing money, &c., out of post letters. (7 Wm IV. & 1 Vic. c. 36, ss. 27, 41, 42.)

10. Stealing post letter-bags, or post letters from post office-bags or from post-offices, or from the officers of the post-office, or from mail-boxes; or stopping mails with intent to rob or search them. (7 Wm IV. & 1 Vic. c. 36, ss. 28, 41, 42.)

11. Receiving letters or other property the stealing, &c., whereof is felony under the Post-office Acts, knowing the same to have been stolen, &c. (7 Wm IV. & 1 Vic. c. 36, ss. 30, 41, 42.)

12. Forgery of the name or handwriting of the Receiver-General of the General Post-office, &c. to any draft &c. on the Bank. (7 Wm IV. & 1 Vic. c. 36, ss. 33, 41, 42.)

13. Transportation for life or not less than seven years, or imprisonment for any term not exceeding four years, with or without hard labour.  

1. Taking away or detaining, from motives of lucre, a heir, &c., against her will, with intent to marry or defile her, &c. (9 Geo IV. c. 94, ss. 10, 11.)

14. Transportation for life or not less than seven years, or imprisonment for any term not exceeding four years, with or without hard labour; or such fine as the court shall award. (9 Geo IV. c. 94, ss. 9, 9.)

15. Transportation for life or not less than seven years, or imprisonment for any term not exceeding four years.  

1. Persons employed in the Public Record Office certifying &c. true false copies of records in the custody of the Master of the Rolls. (2 & 3 Vic. c. 94, ss. 19 in part.)

2. Forgery of the signature of any Assistant Record Keeper, for the purpose of counterfeiting a certified copy of a record, &c., or the seal of the Public Record Office. (3 & 4 Wm IV. c. 94, ss. 19 in part.)

16. Transportation for life or not less than seven years, or imprisonment for any term not exceeding four years.  

1. Stealing in a dwelling-house to the value of 5d. or more. (7 & 8 Geo IV. c. 29, ss. 12; & 3 & 4 Wm IV. c. 62; 3 & 4 Wm IV. c. 44, ss. 4; & 7 Wm IV. & 1 Vic. c. 90, ss. 1 and 3.)

2. Breaking, entering, and stealing in a dwelling-house to any value. (7 & 8 Geo IV. c. 29, ss. 12; & 3 & 4 Wm IV. c. 62; 3 & 4 Wm IV. c. 44, ss. 4; & 7 Wm IV. & 1 Vic. c. 90, ss. 1 and 3.)

3. Entering and stealing in a dwelling-house to the value of 5d. or more. (7 & 8 Geo IV. c. 29, ss. 12; 3 & 4 Wm IV. c. 44, ss. 4; & 7 Wm IV. & 1 Vic. c. 90, ss. 1 and 3.)

4. Breaking, entering and stealing in buildings within the curtilage of a dwelling-house, but having no communication with the dwelling-house, either immediate or by means of a covered and inclosed passage leading from the one to the other. (7 & 8 Geo IV. c. 29, ss. 13 and 14; 7 Wm IV. & 1 Vic. c. 90, ss. 2 and 3.)

5. Breaking, entering and stealing in shops, warehouses or counting-houses. (7 & 8 Geo IV. c. 29, ss. 15; 7 Wm IV. & 1 Vic. c. 90, ss. 2 and 3.)

* See below, the punishment for a first offence.

† For the purpose of this and the next offence no building, although within the curtilage of a dwelling-house, shall be deemed to be a dwelling-house, which would not be deemed to be so for the purpose of burglary, that is, no building between the dwelling-house and the curtilage, or communication, either immediate or by means of a covered and inclosed passage leading from the one to the other. See the 7 & 8 Geo IV. c. 29, ss. 12.
6. Stealing to the value of 10s. goods of silk, woollen, linen or cotton cloth, lying in any place during any stage of manufacture. (7 & 8 Geo. IV. c. 29, s. 16; 7 Wm. IV. & 1 Vict. c. 90, ss. 2 and 3.)

7. Stealing goods, from vessels, &c. in ports or upon navigable waters, or on board ships or vessels, or on the quay or wharf adjacent thereto. (7 & 8 Geo. IV. c. 29, s. 17; 7 Wm. IV. & 1 Vict. c. 90, ss. 2 and 3.)

8. Maliciously killing, maiming or wounding cattle. (7 & 8 Geo. IV. c. 30, s. 16; 7 Wm. IV. & 1 Vict. c. 90, ss. 2 and 3.)

9. Maliciously destroying hop-bounds growing on poles in hop plantations. (7 & 8 Geo. IV. c. 30, s. 18; 7 Wm. IV. & 1 Vict. c. 90, s. 5.)

10. Stealing in a dwelling-house, &c. by threats or menace putting any inmate in bodily fear. (7 Wm. IV. & 1 Vict. c. 86, ss. 5 and 7.)

11. Robbery or stealing from the person. (7 Wm. IV. & 1 Vict. c. 87, ss. 5 and 10.)

12. Plundering vessels in distress, or wrecked, stranded, or cast on shore, or anything belonging to such vessel. (7 Wm. IV. & 1 Vict. c. 89, ss. 8 and 12.)

13. Maliciously destroying any part of a vessel in distress, or wrecked, stranded or cast on shore, or anything belonging to such vessel. (7 Wm. IV. & 1 Vict. c. 89, ss. 9 and 10.)

XX. Transportation for fourteen years.

1. Solomnising marriage at any other time than that prescribed by law, or without banns, unless by licence or under the provisions of the 5 & 8 Wm. IV. c. 85 (which allows marriages to be solemnised before the Registrar of the district), or pretending to be in holy orders and solemnising marriage according to the rites of the Church of England. (4 Geo. IV. c. 76, s. 21.)

2. Being possessed &c. without lawful excuse, of forged bank-notes, &c. (11 Geo. IV. & 1 Wm. IV. c. 66, ss. 12 and 28.)

3. Without the authority of the Bank, making or being possessed of instruments for making, &c. paper used by the Bank for bank-notes, &c. (11 Geo. IV. & 1 Wm. IV. c. 66, s. 13.)

4. Without the authority of the Bank, engraving, making or being possessed of instruments for making, &c. bank-notes, &c., or any character or ornament resembling any part of a bank-note, &c. (11 Geo. IV. & 1 Wm. IV. c. 66, ss. 15 and 16.)

XX. Transportation for any term not exceeding fourteen years.

1. Aiding prisoners to escape, or in attempting to escape from prison, whether an actual escape be made or not. (4 Geo. IV. c. 64, s. 43.)

2. Rescuing offenders sentenced to be transported or banished. (5 Geo. IV. c. 84, s. 22.)

3. Forgery certificates given under the Income Tax Act. (5 & 6 Vict. c. 181, continued in force by 9 Vic. c. 4.)

XXI. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding three years, nor less than one year, with or without hard labour, or solon rectorate or of such punishment, the

4. Without authority, making or being possessed of instruments for forging, &c. paper used by any other bank than the Bank of England. (11 Geo. IV. & 1 Wm. IV. c. 66, ss. 17 and 26.)

5. Without authority, engraving, making or being possessed of instruments for making, &c. foreign bills, &c. of any other bank than the Bank of England. (11 Geo. IV. & 1 Wm. IV. c. 66, ss. 18 and 26.)

6. Without authority, making or being possessed of instruments for making, &c. foreign bills, &c. (11 Geo. IV. & 1 Wm. IV. c. 66, ss. 19 and 26.)

XXII. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding three years, nor less than one year, with or without hard labour or solon rectorate or of such punishment, the

1. Subscribing false petitions to the Secretary of the Admiralty, or personating the representatives of deceased seamen or marines, in order to procure a certificate from the Inspector of Royal Marines, &c., thereby to obtain, without probate or letters of administration, any allowance from the Commissariat Fund of the Navy, &c. (11 Geo. IV. & 1 Wm. IV. c. 20, ss. 87 in part and 88.)

2. Submitting false petitions to the Secretary of the Admiralty, or personating the representatives of deceased seamen or marines, in order to procure a certificate from the Inspector of Royal Marines, &c., thereby to obtain, without probate or letters of administration, any allowance from the Commissariat Fund of the Navy, &c. (11 Geo. IV. & 1 Wm. IV. c. 20, ss. 87 in part and 88.)

XXII. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding five nor less than three years, with hard labour.

1. Trading in slaves either directly or indirectly, or entering into contracts in connexion therewith; or forging certificates of valuation, sentences or decrees of condemnation or restitution, &c. (5 Geo. IV. c. 113, s. 10; 3 & 4 Wm. IV. c. 73.)

XXIV. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding five nor less than three years, with hard labour.

1. Tracing in slaves either directly or indirectly, or entering into contracts in connexion therewith; or forging certificates of valuation, sentences or decrees of condemnation or restitution, &c. (5 Geo. IV. c. 113, s. 10; 3 & 4 Wm. IV. c. 73.)

XXXIII. Transportation for any term not exceeding fourteen nor less than seven years, or imprisonment not exceeding three years, with or without hard labour or solon rectorate or of such punishment, the

2. Embezzlement by clerks or servants. (7 & 8 Geo. IV. c. 29, ss. 4 and 46.)

3. Robbery of the property, the stealing or taking whereof is felony, knowing the same to have been stolen, &c. (7 & 8 Geo. IV. c. 29, ss. 4 and 44.)

4. Booting and others concealing, &c. and not reporting according to the law, or obliterating the marks, &c. on, anchors or other articles found by them on the coast, &c. (provided the stealing of such articles on shore would amount to felony). (1 & 2 Geo. IV. c. 75, ss. 1; and c. 76.)

5. Obtaining in any manner, &c. without lawful excuse, of forged bank-notes, &c. (11 Geo. IV. & 1 Wm. IV. c. 66, ss. 15 and 16.)

6. Without the authority of the Bank, engraving, making or being possessed of instruments for making, &c. bank-notes, &c., or any character or ornament resembling any part of a bank-note, &c. (11 Geo. IV. & 1 Wm. IV. c. 66, ss. 15 and 16.)

7. Without the authority of the Bank, making or being possessed of instruments for making, &c. paper used by the Bank for bank-notes, &c. (11 Geo. IV. & 1 Wm. IV. c. 66, s. 13.)

8. Forgery, &c. of assay marks on gold or silver wares; or fraudulently using genuine dies provided for marking such wares. (7 & 8 Vic. c. 22, s. 2.)

9. Swearing false oaths, &c. in any contract or conveyance or other public documents, for the purpose of deceiving her Majesty's property in such cases. (9 & 10 Wm. III. c. 41; 39 & 40 Geo. III. c. 89, ss. 4 and 7; 54 Geo. III. c. 60; 55 Geo. III. c. 127; 56 Geo. III. c. 188.)

* See 7 & 8 Geo. IV. c. 99, s. 13, referred to in note* p. 160; it is doubtful if the indulgence of the term "solemnising marriage" can "apply to the above offence; though in all probability it would be held to do so, the offender being convicted of the one (see 7 & 8 Geo. IV. c. 99, s. 13) in which that definition was intended to apply.

* See 7 & 8 Geo. IV. c. 99, s. 13, referred to in note* p. 160; it is doubtful if the indulgence of the term "solemnising marriage" can "apply to the above offence; though in all probability it would be held to do so, the offender being convicted of the one (see 7 & 8 Geo. IV. c. 99, s. 13) in which that definition was intended to apply.

* See 7 & 8 Geo. IV. c. 99, s. 13, referred to in note* p. 160; it is doubtful if the indulgence of the term "solemnising marriage" can "apply to the above offence; though in all probability it would be held to do so, the offender being convicted of the one (see 7 & 8 Geo. IV. c. 99, s. 13) in which that definition was intended to apply.
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XXIX. Transportation for seven years.

1. Obstructing the execution of process, &c., within the hamlet of Wapping, Stepney, or any other place within the limits of the weekly bills of mortality, wherein persons shall unlawfully assemble and associate for the sheltering themselves from the bills of mortality which have been made by a presentment of the grand jury at a general or quarter sessions of the proper county. (11 Geo. I. c. 22, ss. 1 and 2.)

2. Aiding the escape from officers of justice of prisoners in their custody for the purpose of being carried to gaol by virtue of a warrant of commitment for treason or felony, or the escape of prisoners from their way for transportation. (16 Geo. II. c. 31, s. 3.)

3. Riotously assembling, to the number of five or more, to rescue offenders against the Acts relating tospirituous liquors; or assaulting persons who have given, &c., evidence, &c., against such offenders, &c. (24 Geo. II. c. 28, s. 28.)

4. Prisoners for debt not delivering in under the Lords' Act a true account of all their estate and effects, &c. (52 Geo. III. c. 59, s. 17; 33 Geo. III. c. 5; 39 Geo. III. c. 50.)

5. Damaging, &c., buoys, &c., fixed to the anchors or moorings of vessels in the Thames, with intent to steal the same. (36 Geo. III. c. 9, ss. 2 and 6.)

6. Being convicted a second time of unlawfully stopping or attempting to stop, or of otherwise preventing the conveyance of grain to or from any city, market-town or place of public supply. (11 Geo. II. c. 22; 36 Geo. III. c. 9, ss. 2 and 6.)

7. With intent to prevent the removal of grain, pulling down or otherwise destroying granaries, &c. (36 Geo. III. c. 9, ss. 2 and 6.)

8. Forfeiture of the declarations of the return of premiums on policies or contracts of insurance. (54 Geo. III. c. 133, s. 10; 54 Geo. III. c. 134, s. 11.)

9. Forcibly removing officers for goods seized under 6 Geo. IV. c. 80 (for repealing the duties on spirits distilled in England, &c.), or otherwise forcibly opposing the execution of the powers of that Act. (6 Geo. IV. c. 80, s. 143.)

10. Being found in company with more than four persons with smuggled goods, or in company with only one person within five miles of the coast, &c., with such goods, and armed or disguised. (9 & 10 Vict. c. 87, s. 65.)

11. Forfeiture of the superscription of a post letter with intent to avoid the payment of postage. (7 WM. IV. and 1 Vict. c. 36, s. 34.)

XXX. Transportation for any term not exceeding seven years.

1. Forgery of the seal, &c., of the British Society for extending the Fisheries and improving the Sea Coasts of the Kingdom. (1 Geo. IV. c. 93.)

2. Administering oaths intended to bind the person taking the same to engage in any seditious purpose, &c., or to be of any association or conspiracy formed for any such purpose, &c. (38 Geo. III. c. 102, ss. 11 and 12.)

3. Counterfeiting foreign gold or silver coin, not permitted to be current within the realm. (37 Geo. III. c. 126, s. 1.)

4. Bringing any such coin into the realm with intent to utter the same. (37 Geo. III. c. 126, s. 3.)

5. Boatmen, &c., conveying anchors, &c., which they know to have been swept for or otherwise taken possession of without being reported according to law, to any foreign port, &c., and there disposing of the same. (1 & 2 Geo. IV. c. 75, s. 15.)

XLI. Transportation for seven years, or imprisonment for any period not less than two years.

1. Without lawful excuse, making or being possessed of any instrument for making the paper used for permits by the Commissioners of Excise, or being possessed of any such paper, or engraving, &c., any plate, &c., for making or printing the paper used for permits, &c. (2 WM. IV. c. 16, s. 3.)

2. Without lawful excuse, making or being possessed of instruments for making the paper to be used for postage covers, or being possessed of any such paper, or by any means imitating or causing to appear in any manner, any such paper, &c., to be used in postage covers. (5 & 6 Vict. c. 29, s. 29.)

XXXII. Transportation for seven years, or imprisonment not exceeding four years.

1. Forgery of certificates or bills of exchange mentioned in 2 & 3 WM. IV. c. 106 (An Act for enabling Officers, &c., in the Army to draw for their Half-pay and Allowances). (2 & 3 WM. IV. c. 106, ss. 9 and 10.)

XXXIII. Transportation for seven years, or imprisonment for any term not exceeding three years nor less than one year, with hard labour.

1. Forgery of the seals, stamps or signatures of such certificates, official or public documents, proceedings of corporations, or joint stock or other companies, or certified copies of such documents or proceedings, as are receivable in evidence in Parliament or in any judicial proceeding, or tendering to evidence such certificates, &c., with false or counterfeit seals &c., thereto; or

2. Forgery of the signature of any equity or common law judge of the Supreme Court of Judicature (2 & 3 WM. IV. c. 167) of the judicial or official document, or tendering in evidence any such document with a false, &c., signature of any such judge thereto; or

3. Printing copies of private acts or of the journals of either House of Parliament, which copies, or any part thereof, are not to have been printed by the printers to the Crown or either House of Parliament, or tendering in evidence any such copy, knowing that the same was not printed by the persons by whom it so had to be printed. (9 & 10 Vict. c. 113, ss. 8 and 9.)

XXXIV. Transportation for seven years, or imprisonment for any term not exceeding three years, with or without hard labour or solitary confinement, or with both.

1. Persons employed under the Post-office stealing, embezelling, secreting or destroying post-letters. (7 WM. IV. and 1 Vict. c. 36, s. 16 and 17.)

XXXV. Transportation for seven years, or imprisonment for any term not exceeding two years nor less than one year, with or without hard labour or solitary confinement, or with both.

1. Forgery of the name or handwriting of witnesses attesting the execution of powers of attorney to transfer any public stock transferable at the Bank or South Sea House, or any capital stock of any body corporate, &c., established by charter or act of parliament, or to receive any dividend in respect thereof (11 Geo. IV. & 1 WM. IV. c. 66, ss. 8 and 26); or copies of registers of baptisms, marriages, &c., or burials, directed by law to be transmitted to the registrar of the diocese in which the church is held or in which the making false entries in such copies, &c. (11 Geo. IV. & 1 WM. IV. c. 66, ss. 22 and 26.)

2. Clerks, &c., of the Bank or South Sea House, with intent to defraud any person of any money, making false entries, or false or greater or less amount than the persons on whose behalf they are made out are entitled to. (11 Geo. IV. & 1 WM. IV. c. 66, ss. 9 and 26.)

XXXVI. Transportation for seven years, or imprisonment for any term not exceeding two years, with or without hard labour or solitary confinement, or with both; and the offender, if a male, may be once, twice, or thrice publicly or privately whipped, in addition to such imprisonment.

1. Forgery of the stamps or seals on hides or skins (9 Ann. c. 11; 10 Ann. c. 99; 5 Geo. I. c. 2, s. 9; 52 Geo. III. c. 145, s. 1; 78 Geo. III. c. 28, ss. 8 and 9; 11 Geo. IV. c. 133, s. 1; 7 & 8 Geo. IV. c. 28, s. 9; and 9; 1 WM. IV. c. 17, s. 1); of the name or handwriting of the registrar of the Court of Admiralty or High Court of Appeals of Fries, &c., to any instrument relating to the money or effects of the suitors of those courts (53 Geo. III. c. 151, s. 12; 7 & 8 Geo. IV. c. 28, s. 9;)

* As regards copies of registers of marriages, it would appear that this offence was abolished by 24 Geo. IV. c. 18, now the penalties for the same in such cases are such as attach to acts of fraud in the same manner as in the case of forgery. (1 WM. IV. c. 29, s. 3.)

† As regards registers of baptisms and marriages, in England, he committed with respect to such copies only as were transmitted before that Act came into operation and the Act does not apply to such cases. (5 & 6 Vict. c. 29, s. 5.)

2. There are still some cases in which this enactment is applicable.
Geo. IV. c. 29, s. 8 and 9); of quarantine certificates (6 Geo. IV. c. 78, s. 25; 7 & 8 Geo. IV. c. 28, s. 8 and 9); of the same or handwriting of her Majesty's Commissioners of Works, for workmen and Building boards, to any draft, &c. for money in the Bank, &c. on account of such commissioners, &c. (7 & 8 Geo. IV. c. 28, s. 8 and 9; 10 Geo. IV. c. 50, s. 194; 2 & 3 Wm. IV. c. 1, s. 1); or of the defendant in recovering the recovery of clearing and damage in personal actions (7 & 8 Geo. IV. c. 28, s. 8 and 9; 7 & 8 Vict. c. 19, s. 5 in part).

2. Obstructing the execution of process, &c. within Suffolke Place, or any part of St. George's, in the county of Surrey. (9 Geo. I. c. 28, ss. 1 and 2; 7 & 8 Geo. IV. c. 28, ss. 8 and 9.)

3. Persons having preserved merchandise, &c. belonging to vessels wrecked &c. within the jurisdiction of the Cinque Ports, selling or otherwise making away with the same, or in any manner altering the same with intent to prevent the discovery or identity thereof by the owners. (1 & 2 Geo. IV. c. 76, s. 8; 7 & 8 Geo. IV. c. 28, ss. 8 and 9.)

4. Quarantine officers deserting from their duty or permitting persons &c. to depart from lazaretts, &c., unless by permission under an order in council, &c.; or giving false certificates of vessels having duly performed quarantine. (6 Geo. IV. c. 78, s. 21; 7 & 8 Geo. IV. c. 28, ss. 8 and 9.)

5. Solemnizing marriages (except in the case of Quakers or Jews, or by special licence) in any other place than a church, chapel, or registered office, &c. so in any such office in the absence of the registrar of the district, &c. (7 & 8 Geo. IV. c. 28, s. 8 and 9; 6 & 7 Wm. IV. c. 85, s. 20.)

6. Superintendent registrars issuing certificates for marriage, or registering marriages, contrary to law; or registrars or superintendent registrars issuing licences for marriage, or solemnising marriages, contrary to law. (7 & 8 Geo. IV. c. 28, s. 8; 7 & 8 Wm. IV. c. 85, s. 40; 7 Wm. IV. & 1 Vict. c. 22, s. 3.)

7. Destroying, counterfeiting or inserting false entries in the register-books directed to be acted for by the register, deans, and registrars in England; or forging the seal of the register-office. (7 & 8 Geo. IV. c. 28, s. 8 and 9; 7 & 8 Wm. IV. c. 86, s. 43.)

8. Officer of the court uttering false certificates of indictments and convictions of a previous felony; or any other person signing &c., such certificates as such officer &c. (7 & 8 Geo. IV. c. 28, s. 9 and 11.)

9. Simple larceny. (7 & 8 Geo. IV. c. 29, s. 3 and 4.)

10. Deer-stealing, &c., where the deer are kept in enclosed lands. (7 & 8 Geo. IV. c. 29, ss. 3, 4, and 26.)

11. Deer-stealing, &c., where the deer are kept in unenclosed lands (for a second offence*); or offending a second time &c. in any other office belonging to parts for which a pecuniary penalty only is imposed, whether such second offence be of the same description as the first or not. (7 & 8 Geo. IV. c. 29, ss. 4, 5, and 26.)

12. Deer-stealing, &c., besetting other deer-keepers. (7 & 8 Geo. IV. c. 29, ss. 3, 4, and 29.)

13. Stealing oysters &c. from oyster-beds &c. (7 & 8 Geo. IV. c. 29, ss. 3, 4, and 36.)

14. Stealing or severing with intent to steal, ore, coal &c. from mines &c. (7 & 8 Geo. IV. c. 29, ss. 3, 4, and 37.)

15. Stealing or damaging with intent to steal, or maliciously destroying &c. trees &c. growing in parks &c. or grounds belonging to dwelling-houses, if the value of the article stolen or the amount of injury done exceeds £1, or growing elsewhere, if such value or amount exceeds £5. (7 & 8 Geo. IV. c. 29, ss. 3, 4, and 38; and c. 30, ss. 19 and 27.)

16. Stealing, or damaging with intent to steal, or maliciously destroying &c. trees &c., wherever growing, if the value of the article stolen or the amount of injury done exceeds £1, or growing elsewhere, if such value or amount exceeds £5. (7 & 8 Geo. IV. c. 29, ss. 3, 4, and 38; and c. 30, ss. 19 and 27.)

17. Stealing, or damaging with intent to steal, or maliciously destroying &c. trees &c., wherever growing, if the value of the article stolen or the amount of injury done exceeds £1, or growing elsewhere, if such value or amount exceeds £5. (7 & 8 Geo. IV. c. 29, ss. 3, 4, and 38; and c. 30, ss. 19 and 27.)

* The first offence is punishable on summary conviction only, by fine not exceeding £10/10., or by imprisonment for any term not exceeding three months, and by attachment to the place of the leaflets &c. or the nature thereof. (See 7 & 8 Geo. IV. c. 29, ss. 4, 19, &c.)

** The second offence is punishable on summary conviction only, by fine not exceeding £10/10. (See 7 & 8 Geo. IV. c. 29, ss. 4, 19, &c.)

† The third offence is punishable on summary conviction only, by fine not exceeding £10/10., or by imprisonment for any term not exceeding three months, and by attachment to the place of the leaflets &c. or the nature thereof. (See 7 & 8 Geo. IV. c. 29, ss. 3, 4, and 29; and c. 30, ss. 19 and 27.)

‡ The fourth offence is punishable on summary conviction only, by fine not exceeding £10/10., or by imprisonment for any term not exceeding three months, and by attachment to the place of the leaflets &c. or the nature thereof. (See 7 & 8 Geo. IV. c. 29, ss. 3, 4, and 29; and c. 30, ss. 19 and 27.)

§ The fifth offence is punishable on summary conviction only, by fine not exceeding £10/10., or by imprisonment for any term not exceeding three months, and by attachment to the place of the leaflets &c. or the nature thereof. (See 7 & 8 Geo. IV. c. 29, ss. 3, 4, and 29; and c. 30, ss. 19 and 27.)

¶ The sixth offence is punishable on summary conviction only, by fine not exceeding £10/10., or by imprisonment for any term not exceeding three months, and by attachment to the place of the leaflets &c. or the nature thereof. (See 7 & 8 Geo. IV. c. 29, ss. 3, 4, and 29; and c. 30, ss. 19 and 27.)

** The seventh offence is punishable on summary conviction only, by fine not exceeding £10/10., or by imprisonment for any term not exceeding three months, and by attachment to the place of the leaflets &c. or the nature thereof. (See 7 & 8 Geo. IV. c. 29, ss. 3, 4, and 29; and c. 30, ss. 19 and 27.)

† The eighth offence is punishable on summary conviction only, by fine not exceeding £10/10., or by imprisonment for any term not exceeding three months, and by attachment to the place of the leaflets &c. or the nature thereof. (See 7 & 8 Geo. IV. c. 29, ss. 3, 4, and 29; and c. 30, ss. 19 and 27.)

‡ The ninth offence is punishable on summary conviction only, by fine not exceeding £10/10., or by imprisonment for any term not exceeding three months, and by attachment to the place of the leaflets &c. or the nature thereof. (See 7 & 8 Geo. IV. c. 29, ss. 3, 4, and 29; and c. 30, ss. 19 and 27.)

§ The tenth offence is punishable on summary conviction only, by fine not exceeding £10/10., or by imprisonment for any term not exceeding three months, and by attachment to the place of the leaflets &c. or the nature thereof. (See 7 & 8 Geo. IV. c. 29, ss. 3, 4, and 29; and c. 30, ss. 19 and 27.)
of debts or damages in personal actions, without lawful autho-
rities. (7 & 8 Geo. IV. c. 28, ss. 8 and 9; 7 & 8 Vic. c. 19, s.
5 in part.)

35. Workmen in mines in Cornwall removing or concealing ore with intent to defraud the proprietors of such mines. (2 & 3 Geo. IV. c. 10.)

XXXVII. Transportation for seven years, or imprisonment for any term not exceeding two years, with or without hard labour; and the offender, if a male, may be once, twice, or thrice publicly or privately whipped, in addition to such imprisonment.

1. Child-stealing. (9 Geo. IV. c. 31, s. 21.)

XXXVIII. Transportation for seven years, or imprisonment for any term not exceeding two years, with or without hard labour.

1. Bigamy. (9 Geo. IV. c. 31, s. 22.)

XXXIX. Transportation for any term not exceeding seven years, or imprisonment for any number of years.

1. Cutting away or in any way injuring or concealing buoys, &c. belonging to vessels or attached to the anchors or cables of vessels, whether in distress or otherwise.† (1 & 2 Geo. IV. c. 75, s. 11.)

XL. Transportation for any term not exceeding seven years, or imprisonment not exceeding two years, with or without hard labour or solitary confinement, or with both.

1. Counterfeiting the queen's current copper coin; or, without lawful authority, making or being possessed of instruments for counterfeiting such coin; or buying or selling such coin at a lower price than its valuation by its denomination imports. (2 Wm. IV. c. 34, ss. 12 and 15.)

XLI. Transportation for any term not exceeding seven years, or fine, imprisonment, and such corporal punishment in public or private whipping, as the court shall direct.

1. Slaughtering or flaying horses or other cattle without taking out the licence and giving the notice required by the Act for regulating slaughtering-houses, or doing so at any other time than within the house limits by the Act, or on or delaying to do so, when prohibited by the inspector. (20 Geo. III. c. 71, s. 8.)

IV. MISDEMEANORS.

Misdemeanors are punishable as follows: viz.:

1. Transportation for life.

2. Being at large within the United Kingdom after being sentenced to be banished under the provisions of the Roman Catholic Relief Act (10 Geo. IV. c. 47), without some lawful excuse, after three calendar months from such sentence. (10 Geo. IV. c. 7, s. 36.)


1. Jesuits or members of Religious Orders or Societies of the Church of Rome, bound by monastic or religious vows, coming into the kingdom. (10 Geo. IV. c. 7, s. 29); or

2. Having obtained the Secretary of State's licence to come into the kingdom, within twenty days after the date of the licence mentioned in such licence. (10 Geo. IV. c. 7, s. 31.)

3. Within any part of the kingdom, becoming a Jesuit or member of any Society of the Church of Rome bound by monastic or religious vows. (10 Geo. IV. c. 7, s. 54.)

III. Transportation for the term of fourteen years, or, in mitigation or commutation of such punishment, the offender to be publicly whipped, fined or imprisoned, or all or any one or more of them.

1. Not being a contractor with the Commissioners of the Navy, Ordinance or Victualling Office for her Majesty's usual selling, receiving or being possessed of any warlike or naval, ordnance, victualling or other public stores, without being able to produce a certificate from the Commissioners of the Navy &c. expressing the situation of such stores being so in possession. (9 & 10 Wm. III. c. 41; 9 Geo. I. c. 8, s. 3; 39 &

* The 1 & 2 Geo. IV. c. 74, s. 4, contains a similar provision as regards buoys &c. within the jurisdiction of the Channel Ports, but subjects the offender to transportation not exceeding fourteen years.

† This and the next two offences do not apply to members of Female Societies.

‡ The mode in which the 29 & 30 Geo. III. c. 89, s. 1, imposes the above penalties in respect of those offences, is by enacting that persons who commit them shall be judged according to the law of nations, and shall, and shall be convicted thereof in due form of law, be transported beyond the seas, for the term of fourteen years, in manner of other receivers of stolen goods are directed to be transported by the laws and statutes of this kingdom. (See secs. 49 & 50.)

§ In the case of these two matters, the courts are required to make an order in respect of the above penalties, and for the purpose of carrying them into effect, or on conviction, or otherwise as they shall think fit.

∥ The word "game" includes hare, pheasants, partridge, grouse, buzzard, heron, eagle, and bustards.

* For the purposes of 9 Geo. IV. c. 69, the word "game" includes hare, pheasants, partridge, grouse, buzzard, heron, eagle, and bustards.

∥ The punishment for this offence is imprisonment not exceeding one year.

† See the 5 & 6 Geo. IV. c. 100, s. 17, which declares that persons winning money, &c. by cheating at cards or other games, shall be guilty of obtaining such money, &c. by false pretences, and shall be punished accordingly.

‡ The punishment for a misdemeanor at common law is fine and imprisonment.

|| It is only when the offender is prosecuted under 5 Eliz. c. 59, that he is liable to this portion of these penalties. If prosecuted at common law he is punishable with fine and imprisonment, but may be sentenced to other penalties stated above. The common law offence extends also to subornation of perjury in any judicial proceeding.
with hard labour for a term not exceeding seven years, or may not exceed seven years; and, in addition to or in lieu of the before-mentioned punishments, may be imprisoned with hard labour for any term not exceeding the term for which he may be imprisoned as aforesaid; and, if in any of the cases mentioned he be convicted as a witness in any court of record, unless the judgment given against him be reversed.

1. Subornation of perjury in any of the Queen's Courts of Chancery, Court of Record, or in any Leet, View of Frankpledge, or Law-day, Ancient Demesne Court, Hundred Court, Court Baron, or in the Court or Courts of the Stannary in the counties of Devon and Cornwall; or suborning witnesses sworn to perjury, or perjury by the government or regiment.* (5 Eliz. c. 30, s. 3, 4, and 5; 29 Eliz. c. 5; 21 Jac. I, c. 28, s. 8; 2 Geo. II. c. 24, s. 2; 3 Geo. IV. c. 114; 7 Wm. IV. & 1 Vict. c. 23.)

XIII. Fine of 20l. and imprisonment for six months; and besides the before-mentioned punishment the offender may be imprisoned with hard labour for a term not exceeding seven years, or transported for a term not exceeding seven years; and, in addition to or in lieu of the before-mentioned punishments, may be imprisoned with hard labour for any term not exceeding the term for which he may be imprisoned as aforesaid; and the offender on conviction cannot thenceforth be received as a witness in any Court of Record, unless the judgment given against him be reversed.

1. Perjury in any of the Courts mentioned above in the case of subornation of perjury, or by any person examined as a witness. (5 Eliz. c. 30, s. 3, 4, and 5; 29 Eliz. c. 5; 21 Jac. I, c. 28, s. 8; 2 Geo. II. c. 25, s. 2; 3 Geo. IV. c. 114; 7 Wm. IV. & 1 Vict. c. 23.)

2. Seamen or marines attempting to obtain their pay by means of forged certificates of their discharge from the queen's ships, or from hospitals or sick-quarters. (11 Geo. IV. & 1 Wm. IV. c. 20, s. 89; 7 Wm. IV. & 1 Vict. c. 23.)

3. Forgery of certificates of the Commissioners for executing the Peace, and for High Admiration, or of seas or sale of any naval or signalling vessels. (2 Wm. IV. c. 40, s. 32; 7 Wm. IV. & 1 Vict. c. 23.)

4. Making false declarations or signing false notices for the purpose of procuring marriages; or

5. Forbidding the issue of any superintendent registrar's certificate, by falsely representing oneself to be a person whose consent to such marriage is required by law. (6 & 7 Wm. IV. c. 60, s. 41; 7 Wm. IV. & 1 Vict. c. 23.)

XIV. Transportation for seven years, or imprisonment with hard labour for any term not exceeding three years.

1. Assisting or obstructing persons duly employed for the purpose of securing justice. (6 & 7 Wm. IV. c. 60, s. 41; 7 Wm. IV. & 1 Vict. c. 23.)

XV. Transportation for seven years, or imprisonment with or without hard labour for any period not exceeding three years; and during such imprisonment the offender may be punished as often and in such manner and form as the Court shall direct, not exceeding thrice.

1. Discharging or aiming fire or other arms, or discharging or attempting to discharge any explosive substance, at or near the person of the queen, or striking or attempting to strike at the person of the queen, or in any other manner throwing or attempting to throw anything at or upon her person, with intent to injure or alarm the queen or to break the public peace, or whereby the public peace may be endangered; or having fire or other arms, or any explosive or dangerous matter or

* See also 18 Geo. III, c. 29, s. 4 (made perpetual by 21 Geo. II, c. 33), as to subornation of perjury and perjury by agents, &c., for which the court may cause them, after an examination in a summary way, to be transported for seven years, if they do not appear to be indelible.

† It is only when the offender is proceeded against under Eliz. c. 9, that he is liable to transportation, and not to imprisonment. These provisions are for common law offenses as well as for offenses at common law, and not under the statute.

‡ A public breach of the peace, although mentioned above, by which cases of false swearing are declared to be perjury, or to be punishable as perjury; but it would have occupied too much space to have inserted them.

§ For the definition of fraud, see p. 172, note *

∥ The first two offenses are punishable on summary conviction.

¶ This forfeiture, in lieu of other fines or penalties, is to be levied by the mariners above, constituted the offense a felony.

‖ The punishment for the first offense is fine of 10l. and imprisonment for one year. (5 Eliz. c. 16, s. 7.)

* This offense is to be considered as virtually obsolete.

† The punishment for the first offense is imprisonment for six months, and for the second and third offenses, a fine of 10l. and imprisonment for any term not exceeding one year. (5 Eliz. c. 16, s. 7.)

∥ This offense is to be considered as virtually obsolete.

¶ The punishment for the first offense is imprisonment for six months, and for the second offense, a fine of 10l. and imprisonment for any term not exceeding one year. (5 Eliz. c. 16, s. 7.)

‖ Besides being imprisoned, the offender for the first offense forfeits the
3. Persons not having any spiritual promotion committing any such last-mentioned offence, after their first conviction.  
(35 Geo. III. c. 60, s. 13.)

4. Furtive driving, &c., by persons having charge of stage-coaches or public carriages, not being hackney-coaches drawn by two horses only, and not plying for hire as stage-coaches, whereby any person is injured. (1 Geo. IV. c. 4.)

5. Buying or offering to sell, or attempting to sell, or engaging in any place of business in any manner relating to the sale or purchase thereof. (5 & 6 Edw. VI. c. 16; 40 Geo. III. c. 196, s. 3; 6 Geo. IV. c. 105, s. 10.)

6. Officers exacting fees from prisoners against whom no bill of indictment is found by the grand jury, or who are acquitted on their trial or discharged by proclamation for want of prosecution. (36 Geo. III. c. 60, ss. 4 and 9.)

7. Officers of excise or excisemen by the misconduct causing waste, &c., in merchandise warehoused in warehouses under the Act for permitting goods imported to be secured in warehouses without payment of duty on first entry. (4 Geo. IV. c. 24, s. 72.)

8. False certificates or representations endeavouring to obtain from Chelsea Hospital any pension, privilege or advantage. (7 Geo. IV. c. 16, s. 25.)

9. Setting spring-guns or man-traps, except within a dwelling-house, between sun-set and sun-rise, for the protection thereof. (7 & 8 Geo. IV. c. 18, ss. 1 and 4.)

10. Jesuits, or members of any religious order or society of the Church of Rome, by monastic or religious vows, within the United Kingdom, admitting any person to become a member of any such order or society. (10 Geo. IV. c. 7, s. 8.)

11. Parish officers refusing to call meetings, &c., according to the provisions of the Act for the better Regulation of Vestries. (1 & 2 Wm. IV. c. 60, s. 11.)

12. Making false answers to any of the questions directed by the Reform Act to be put by the returning officer at elections of members of parliament, if required by any candidate, to any voter at the time of his tendering his vote. (2 & 3 Wm. IV. c. 45, s. 58.)

13. Refusing to attend, &c., the Poor Law Commissioners (4 & 5 Wm. IV. c. 76, s. 13); the Tithe Commissioners (6 & 7 Wm. IV. c. 71, s. 88); or the Copyhold Commissioners (4 & 5 Wm. IV. c. 36, s. 94).

14. Forgery, &c., of protections from service in the navy. (5 & 6 Wm. IV. c. 24, s. 3.)

15. Making false declarations in cases where declarations are substituted for oaths by the Act for abolishing unnecessary Oaths. (5 & 6 Wm. IV. c. 62, s. 21.)

16. Executing &c., renewed ecclesiastical leases, knowing the rent required by law contained therein to be false. (6 & 7 Wm. IV. c. 76, s. 6.)

17. Making false declarations in cases where declarations are substituted for oaths by the Act for abolishing unnecessary Oaths. (5 & 6 Wm. IV. c. 62, s. 21.)

18. Making false statements in declarations required to be delivered to the Commissioners of Stamps and Taxes before being allowed to print and publish newspapers. (6 & 7 Wm. IV. c. 76, s. 6.)

19. Making, &c., false declaration of being qualified to be elected a member of the House of Commons. (1 & 2 Vict. c. 45, s. 7.)

20. Falsehood in statements of pensions for service in her Majesty's navy, royal marines or ordinance. (2 & 3 Vict. c. 51, s. 8.)

21. Making false declarations touching any of the matters contained in the Act for procuring Returns relative to Highways and Turnpikes. (2 & 3 Vict. c. 40, s. 9.)

22. Officers of railways making false returns, under the authority of the entrance, commitment or discharge of such prisoners, or detaining prisoners for non-payment of fees. (55 Geo. III. c. 60, s. 13.)

* They are also, upon conviction, rendered incapsable of holding their offices.

† See the 3 Geo. IV. c. 36, s. 19.

‡ It would appear that whereas a person is made to find sureties and recognizances, he is not to be deemed as having been convicted of all his spiritual promotions.

§ As declared by the Act.

‖ The punishment for the first offence is imprisonment for six months; and for the second offence, imprisonment for twelve months.

¶ No person committing any of the above offences during the first three years for which he was convicted is disqualified for holding any office of profit, which he is made to forfeit, and sold to the purchaser, if the purchaser be willing to purchase it. But if any person, before the expiration of that period, makes a new purchase or sale of the same office, the purchaser is not thereby enabled to take possession of the office, but such new purchase or sale is, under the Act, void.

‖‡ That is, as declared by the judges.

†† The offender is also, on conviction, rendered for ever incapable of holding or copying any office under the crown.

* This office does not apply to female societies. (10 Geo. IV. c. 7, s. 7.)
Act for regulating railways, to the committee of the Privy Council for Trade. (5 & 6 Vict. c. 97, s. 4.)

23. Making false returns of corn, under the Act regulating the importation of corn. (5 & 6 Vict. c. 14, s. 43.)

24. Making false entries in the Register Book of Copyrights. (5 & 6 Vict. c. 46, s. 12.)

25. Voters making false answers to returning officer at elections of members of parliament. (6 & 7 Vict. c. 18, s. 81.)

26. Actuaries or other persons holding appointments in savings' banks, receiving deposits and not paying the same over to the managers of such banks, &c. (7 & 8 Vict. c. 83, s. 4.)

27. The registrar of joint-stock companies or any person employed under him, demanding or receiving any gratuity, or reward beyond the fees allowed by law. (7 & 8 Vict. c. 110, s. 22.)

28. Directors of joint-stock companies by whom certificates of shares are issued, making false statements on such certificates as to the date of the first complete registration of such companies. (7 & 8 Vict. c. 110, s. 26 in part.)

29. Persons knowing dogs or skins of dogs found in their possession, by virtue of a search warrant, to be stolen dogs, or the skins of stolen dogs (for the second offence). (6 & 9 Vict. c. 47, s. 3 in part.)

30. Corruptly taking any reward for aiding persons to recover stolen &c. dogs. (6 & 9 Vict. c. 47, s. 6.)

31. Offences against the provisions of the 8 & 9 Vict. c. 100 (An Act for the regulation of the care and treatment of Lunatics), and the 8 & 9 Vict. c. 126 (An Act to amend the laws for the provision and regulation of Lunatic Asylums for counties and boroughs, and for the maintenance and care of Pauper Lunatics, in England), declared by those Acts to be misdemeanours.

32. Using contemptuous words or gestures of or against the queen.

33. Unlawful assemblies.

34. Riots.

35. Riots.

36. Affrays.

37. Conspiracy.

38. Bribery.


40. Blasphemous or seditious libel.

41. Unlawfully refusing to serve public offices.

42. Executing official duties before taking oath of office and giving security, where the same are required by law.

43. Willfully disobeying any statute, by doing what it prohibits or omitting what it commands, whereby the public are or may be injured.

44. Willfully disobeying any lawful warrant, order or command of her Majesty, or any court or person acting in a public capacity and duly authorized in that behalf, where no other penalty or mode of proceeding is expressly provided.

45. Obstructing officers in the execution of any public office or duty.

46. Excess or abuse of authority by public officers.

47. Extortion by public officers.

48. Forfeiture for fraudulent misappropriation by public officers of property under their control as such officers.

49. Unlawfully, and contrary to oath of office, disclosing matter the knowledge of which has been acquired in an official capacity.

50. Assaulting &c. persons on account of anything done by them in connexion with any judicial proceeding.

51. Contempt of courts of justice or magistrates, by uttering scurrilous, insolent, profane, or menacing words, or by acts or gestures expressed or done in the face of such courts or in the presence of such magistrates.

52. By force, or by violent or outrageous conduct, interfering with the proceedings of courts of justice.

53. The wilful omission by judicial officers to do their duty.

54. Oppression by judicial officers.

55. Judicial officers taking bribes.

56. Bribery or otherwise corruptly influencing judicial officers.

57. Persons procuring themselves to be returned as jurors, with intent to obtain a verdict or any undue advantage for any person interested in a trial.

58. Unlawfully preventing persons from serving as jurors.

59. Justices influencing their verdicts by any improper means.

60. Witnesses refusing to be sworn or to give evidence in judicial proceedings.

61. Unlawfully preventing witnesses from giving evidence in judicial proceedings.

62. Endeavouring to procure the commission of perjury.

63. Publishing statements, pending suits or prosecutions, with intent to excite prejudice for or against any party to such suits or prosecutions.

64. Fabricating false evidence.

65. By disposing of dead bodies, without giving notice to the coroner, in cases where inquests ought to be taken, obstructing the taking of such inquests.

66. Gaolers and others, contrary to their duty, allowing dead bodies to remain unburied and to putrefy, without giving notice to the coroner, in cases where inquests ought to be taken.

67. Challenging or provoking to fight, or to commit a breach of the peace.

68. Open indecency in places of public resort or in view thereof.

69. Keeping gaming or other disorderly houses.

70. Arresting or otherwise obstructing the burial of dead bodies.

71. Unlawfully disinterring dead bodies.

72. Buying or selling wines.

73. Selling unwholesome provisions.

74. Maliciously exposing persons labouring under contagious diseases in places of public resort.

75. Common nuisances.

76. Corrupting wells or springs used by the public.

77. Impeckners refusing to receive travellers, their turns not being fully occupied at the time, and a reasonable sum being tendered for accommodation.

78. Battery.

79. False imprisonment.

80. Assaults.

81. Persons maiming themselves, with intent to evade the discharge of any public duty.

82. Cheats.

83. Forgery, in cases where no punishment is provided by statute.

84. Concealing treasure-trove.

85. Forfeiture, fine not exceeding 200L, and costs of suit, for keeping a dog, suit, or other thing, falsely marked, for additional ends, or with intent to evade, or effectually to prevent, imprisonment, or any of them, in such manner and for such space of time as to the court shall seem meet.

1. Being possessed (not being a contractor with the Commission for Inland Waterways, Ordnance, or any other public body, nor being charged to be new, or not more than one-third worn. (39 & 40 Geo. III. c. 89, s. 2; 54 Geo. III. c. 50; 55 Geo. III. c. 127; 56 Geo. III. c. 138, s. 2.)

2. Making, being possessed of, or concealing (not being a contractor as last mentioned) any warlike or naval stores, with the marks used by her Majesty's warlike, naval, or ordnance stores, or any other public stores. (9 & 10 Wm. IV. c. 68, s. 6; 16 Geo. II. c. 8; 17 Geo. II. c. 40; 39 & 40 Geo. III. c. 89, s. 2; 54 Geo. III. c. 60; 55 Geo. III. c. 127; 56 Geo. III. c. 138, s. 2.)

XXXII. Fine not exceeding 500L, or imprisonment for any term, for being possessed of two years or less.

1. Aiding the escape of convicts from New South Wales or Van Diemen's Land. (9 Geo. IV. c. 88, s. 34.)

XXXIII. Imprisonment, with or without hard labour, for such an act as the court shall award.

* The first offence is punishable on summary conviction before two or more persons acting as such, not exceeding 20L, as to the justices shall seem meet.

1. This and the following fifty-two offences (39 to 44 inclusive) are misdemeanours at common law, and as such, punishable with fine and imprisonment, as in the Seventeenth Report of the Criminal Law Commissioners, and the authorities thereon. (39 & 40 Geo. III. c. 89, s. 20.)

2. These offences, when committed for a second time, were made punishable as misdemeanours only punishable, by 6 Geo. III. & 1 Geo. IV. c. 9, s. 3; but 11 Geo. IV. & 1 Will. IV. c. 73, repealed the latter portion of the punishment.
1. Unlawfully and carnally knowing girls above the age of ten and under the age of twelve years. (9 Geo. IV. c. 31, s. 17.)

XXXIV. Fine or imprisonment, or both, such imprisonment to be without or without hard labour or solitary confinement, or with both.

1. Unlawfully taking or killing hares or conies, in the night time, in warrens. (7 & 8 Geo. IV. c. 29, ss. 4 and 30.)

2. Unlawfully taking or killing any fish in waters running through or in lands adjoining or belonging to dwelling-houses. (7 & 8 Geo. IV. c. 29, ss. 4 and 34.)

3. Unlawfully destroying turnpikes or toll gates or houses, &c. (7 & 8 Geo. IV. c. 30, s. 14 and 57.)

4. Officers of the Post-Office opening or detaining post letters (7 Wm. IV. & 1 Vict. c. 36, ss. 25 and 42;) or stealing, embezzling, or destroying printed votes or proceedings in Parliament, or printed newspapers, or other printed papers sent by the post, without covers or in covers open on the sides. (7 Wm. IV. & 1 Vict. c. 36, ss. 25 and 42.)

XXXV. Fine or imprisonment, or both, such imprisonment to be with or without hard labour.

1. Forgery of hackney-carriage plates (1 & 2 Wm. IV. c. 22, s. 25;) of stage-carriage plates (2 & 3 Wm. IV. c. 120, s. 32;) or of the licences or tickets of drivers of hackney-carriages, drivers or conductors of stage-carriages, or watermen (1 & 2 Vict. c. 79, s. 12.)

2. Frauds in applying for hackney-carriage or stage-carriage licences. (1 & 2 Wm. IV. c. 22, s. 33; 2 & 3 Wm. IV. c. 120, s. 10.)

XXXVI. Fine or imprisonment, or both.

1. Compounding offences, &c. or otherwise offending against the provisions of the 18 Eliz. c. 5 (An Act to redress disorders in common and other places.) (18 Eliz. c. 6, s. 4; 27 Eliz. c. 10; 56 Geo. III. c. 188, s. 2.)

2. Resting the execution of any legal process, execution, or arrest, without legal reasons, or by the violence of a person having no right to recover such property, or for any purpose whatever. (12 Savoy, Old Bailey, &c.)

3. Illegal imprisonment. (53 Geo. III. c. 141, s. 9.)

4. Persons having the custody of offenders ordered to be confined in Parkhurst Prison, or Pentonville or Millbank Prison, carelessly allowing such offenders to escape. (1 & 2 Vict. c. 82, s. 13; & 5 & 6 Vict. c. 29, s. 25 in part; & 6 & 7 Vict. c. 26, s. 25 in part.)

5. Offences against the Foreign Enlistment Act. (59 Geo. III. c. 69, s. 2.)

6. Unlawfully taking unmarried girls under the age of 16 years out of the possession of those who have the lawful care and control thereof. (18 Eliz. c. 6, s. 4; 27 Eliz. c. 10; 56 Geo. III. c. 188, s. 2.)

7. Arresting clergymen on public process while employed about the performance of divine service. (9 Geo. IV. c. 31, s. 22.)

8. Frauds by Excise officers in the granting of permits, or in the performance of their duties in relation to the same. (2 Wm. IV. c. 16, s. 15.)

9. Altering, destroying, counterfeiting, or trafficking in the register-tickets with which merchant seamen are required to provide themselves. (7 & 8 Vict. c. 112, s. 21.)

10. Making false answers to questions by the registrar of seamen, &c. with reference to the granting of such tickets. (7 & 8 Vict. c. 112, s. 22.)

11. Masters of merchant ships, without the sanction of the consul, &c. discharging or abandoning aboard persons belonging to their ships or crews, or, in case any such person should desert aboard, neglecting to give any public notice in writing to such consul, &c. (7 & 8 Vict. c. 112, s. 46.)

12. Masters, mates, or other officers of merchant ships, wrongfully forgoing on shore, or losing behind on shore or sea, persons belonging to their ships or crews, before the completion of the voyage for which such persons were engaged, or the return of their ships to the United Kingdom. (7 & 8 Vict. c. 112, s. 47.)

13. Masters of merchant ships omitting, when required by the consul, &c. on the complaint of three or more of their crew, to provide proper provisions, water, or medicines, or the requisite certificates thereof, or using any provisions, &c. which the consul, &c. shall have signified to be unfit for use or inappropriate. (7 & 8 Vict. c. 112, s. 57.)

XXXVII. Imprisonment for three years, and fine at the queen's pleasure.†

1. Chapmery. (3 Edw. I. c. 25; 13 Edw. I. st. 1, c. 49; 28 Edw. I. st. 1, c. 11; 33 Edw. I. st. 2; 33 Edw. I. st. 3; 4 Edw. III. c. 7; 4 Edw. III. c. 14; 4 Edw. III. c. 4 and 5; 5 Rich. II. c. 15; 32 Hen. VIII. c. 9.)

2. Maintenance. (3 Edw. I. c. 28 and 33; 33 Edw. I. st. 3; 1 Edw. III. st. 2, c. 14; 4 Edw. III. c. 11; 20 Edw. III. c. 4 and 5; 1 Rich. I. c. 4 and 7.; 7 Rich. II. c. 15; 32 Hen. VIII. c. 9.)

XXXVIII. Great forfeiture.

1. Disturbing any to make free election. (3 Edw. I. c. 5.)

XXXIX. To be adjudged incapable and disabled in law to have or enjoy any office or employment, ecclesiastical, civil or military, or any part in them, or any profit or advantage appertaining to them; and if the offender at the time of being convicted or possessed any office, place or employment, the same is made void.

1. Having been educated in or professed Christianity within this realm, asserting that there are more Gods than one, or denying the Christian religion to be true, or the Scriptures to be of Divinity authority. (9 & 10 Wm. III. c. 32, s. 1; 55 Geo. III. c. 160, s. 2.)

XL. Imprisonment and hard labour for any period not exceeding three years, without or with hard labour, or solitary confinement, or with both.

1. Insolvent debtors or petitioners for protection from process, omitting in their schedules any property, or retaining or excepting out of such schedules, as necessary, property of greater value than 20l., with intent to defraud their creditors. (1 & 2 Vict. c. 110, ss. 99 and 121; 7 & 8 Vict. c. 96, s. 39.)

XLI. Imprisonment for any term not exceeding three years, with or without hard labour, or solitary confinement, or with both.

1. Being posessed of three or more pieces of counterfeit coin, intended to pass for the Queen's current gold or silver coin, knowing the same to be counterfeit and with intent to utter the same. (2 Wm. IV. c. 34, ss. 8 in part and 15.)

XLII. Imprisonment with hard labour for any term not exceeding three years, either in addition to or in lieu of any other punishment or penalty which may be inflicted upon the offender.

1. Being armed, assaulting Excise officers whilst searching for or seizing commodities forfeited under any Act relating to the duty of the Excise. (Excise or Excise officers, &c. with intent to defraud or to render offensive to arrest offenders. (7 & 8 Geo. IV. c. 53, ss. 40 and 43.)

XLIII. Imprisonment for any term not exceeding three years, with or without hard labour.

1. Bankrupts, partners, members of incorporated commercial or trading companies which shall be adjudged bankrupt, falsifying or destroying their books, &c. with intent to defraud their creditors. (5 & 6 Vict. c. 122, s. 34; 7 & 8 Vict. c. 111, s. 30.)

2. Publishing or threatening to publish libels, &c. with intent to extort money. (6 & 7 Vict. c. 96, s. 8.)

XLIV. Imprisonment for one year and grievous fine at the queen's pleasure; or if the offender have not wherewithal, imprisonment for three years.

1. Misprision of felony by sheriffs, coroners, or other bailiffs. (3 Edw. I. c. 9.)

2. Imprisonment for one year and grievous fine; or if the offender have not wherewithal, imprisonment for two years.

1. Bailiffs not being ready, on the hue and cry, to arrest felons. (3 Edw. I. c. 9.)

See also Geo. IV. c. 51, s. 30, which makes it a misdemeanour, punishable with imprisonment for such term as the court shall determine. The case of merchant ships to forec lose on shore or refuse to bring home all the men whom they contain out as are in condition to return. The case of offences of Cheapside and Maintenance is recommended by the Criminal Law Commission of the 19th Report in the Fifth Part.†

† That is, as declared by the judges. This punishment is taken from 33 Edw. I. c. 2 (Statute of Chesterfield, &c. for preserving the peace of the city of Chesterfield, &c. within the limits of the city of Chesterfield, &c. by keeping the peace, &c. within the limits of the city of Chesterfield, &c. for the suppression of the said public tumults, &c. with intent to defraud their creditors. (5 & 6 Vict. c. 122, s. 34; 7 & 8 Vict. c. 111, s. 30.)

† For a first offence the above penalties may be relieved by remission of such compound imprisonment in the same court where the offender was convicted, within four months after such conviction. (s.)

† If a person be a seaman, and, as such, engages in any foreign service of war, or in any other service of war, or the service of his country, he is to be imprisoned for three years, and to be disabled to sue, &c. in any court of law within this realm, or of any other country, or of any other person, or any child, or executor or administrator of any person, or any cap, or any legacy or deed of gift, or to bear any office, civil or military, or any benefit ecclesiastical, for ever within the realm. (s.)

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XLVI. Imprisonment with or without hard labour for any term not exceeding seven years, and if the court shall think fit; and the offender may be required to find sureties for keeping the peace.

1. Assaults with intent to commit felony, or on any peace or circuit officer, or with intent to resist the lawful apprehension or detention of any person, or in pursuance of any conspiracy to raise the rate of wages (9 Geo. IV. c. 31, s. 25); or on special constables. [*] (9 Geo. IV. c. 31. s. 25; 1 & 2 Wm. IV. c. 35, s. 1.)

XLVII. Fine and imprisonment not exceeding two years.

1. Being present at meetings unauthorised by her Majesty, &c., for the purpose of being drugged to the use of arms, or, at such meetings, being so drugged. (90 Geo. III. 1 & Geo. IV. c. 1, s. 1.)

2. Maliciously publishing defamatory libels, knowing them to be false. (6 & 7 Vict. c. 96, s. 4.)

XLVIII. Imprisonment for any term not exceeding two years, with or without hard labour or solitary confinement, or with both. 

1. Soliciting the commission of any felony or misdemeanor punishable by the Post-Office Acts. (7 Wm. IV. 1 & Vict. c. 36, ss. 50 and 42.)

XLIX. Imprisonment with hard labour for any term not exceeding two years.

1. Personating voters at elections of members of Parliament. (6 & 7 Vict. c. 18, s. 88.)

L. Imprisonment with or without hard labour for any term not exceeding two years.

1. Working, by forced labour, &c., endeavouring to conceal the birth of children of which they have been delivered. (9 Geo. IV. c. 31, s. 14.)

2. Bankrupt, within three months next preceding his bankruptcy, obtaining goods on credit under the false pretence of dealing in the ordinary course of trade. (6 & 8 Vict. c. 129, s. 35.)

3. Drunkenness or other misconduct of servants of railway companies. [*] (3 & 4 Vict. c. 97, s. 13.)

LI. Imprisonment for a term not exceeding two years.

1. Embracing on board slaves in the capacity of petty officers, seamen, &c. (6 Geo. IV. c. 113, s. 11; 3 & 4 Wm. IV. c. 73.)

2. Doing any thing to obstruct carriages on railways or to endanger the safety of persons conveyed upon the same. (3 & 4 Vict. c. 97, s. 15.)

LII. Imprisonment for one year, and such further punishment by fine or imprisonment, or both, as to the court shall seem most proper, and the offender to give sureties for good behaviour and to be further imprisoned until they be given. 

1. Witchcraft, fortune-telling, &c., or pretending to discover where property supposed to be stolen or lost may be found. (9 Geo. II. c. 5, s. 4; 56 Geo. III. c. 138, s. 2.)

LIII. Fine or imprisonment, or not exceeding eighteen months, or both, with or without hard labour.

1. Dog-stealing (for the second offence). (8 & 9 Vict. c. 47, s. 2 in part.)

LV. Possession of goods and chattels, real and personal, &c., and if the offender have not goods and chattels to the value of 20l., then, in addition, imprisonment for one year.

1. Maintaining the authority, spiritual or ecclesiastical, of any foreign prince or state claimed within this realm or any of the dominions under the queen's obsequies before the passing of the 1 Eliz. c. 1. [*] (1 Eliz. c. 1, ss. 27 and 28; 7 & 8 Vict. c. 102.)

LV. Imprisonment for any term not exceeding one year, with or without hard labour or solitary confinement, or with both.

1. Uttering counterfeit coin intended to pass for the queen's currency coin, or being possessed of three or more pieces of such coin with intent to utter the same. (2 Wm. IV. c. 34, ss. 12 and 19.)

[*] Assents on special constables may also be published on summary conviction before two justices. (See 1 & 2 Wm. IV. c. 61.)

[*] If published on summary conviction, with imprisonment not exceeding two calendar months, or fine not exceeding 100l., if the person convicted shall make the sum of 20l. to his costs. (1839, 19 & 20 Vict. c. 30, s. 2.)

[*] This fine may be referred to the court at the Quarter-Sessions. (1839, 19 & 20 Vict. c. 30, s. 1.)

[*] This fine, being by statute, does not, as above observed, constitute the offence a felony. (1839, 19 & 20 Vict. c. 30, s. 1.)

[*] The repeal of this offence is recommended by the Commissioners for revising and consolidating the Criminal Law, 'on the ground of its causing great annoyances and disabilities in regard to religious opinions, dated 20th May, 1845.'
parliament, for alteration of matters established by law in church or state, without the previous order of three or more justices of the peace of the county, where the matter arises at the assizes or quarter-seessions, or, if arising in London, of the lord mayor, aldermen, and commons, in common council assembled; or, upon pretense of presenting a petition or other address being accompanied with an excessive number of people, or at any one time with above ten persons. (13 Car. II. c. 5, s. 2.)

LXV. Fine not exceeding 20l., or imprisonment with or without hard labor, for any term not exceeding three months, or fine not exceeding 50l.

LXVI. Offending against the provisions of the Act for regulating schools of anatomy. (3 & 3 Wm. IV. c. 75, s. 15.)

LXVII. Fine not less than 20l., and imprisonment with or without hard labor.

1. Neglecting or disobeying the orders of the Poor Law Commissioners or assistant commissioners, having been twice previously convicted of so doing.† (4 & 5 Wm. IV. c. 76, s. 88.)

LXVIII. Imprisonment until the offender brings into court him which was the first author of the tale, and, if he cannot find him, his motion for punishment as the council shall Adv. the same.†

1. Scandalum magnatum. (3 Edw. I. c. 34; 2 Rich. II. st. 1, c. 5; 12 Rich. II. c. 11.)

LXIX. Forgers.†

1. Members of incorporated commercial or trading companies against which a flat in bankruptcy has issued (not being the persons ordered to prepare the balance sheet), or any other person, wilfully concealing the estate of such companies.† (7 & 8 Vict. c. 111, s. 17.)

LXX. Fine of 40l.

1. Disturbing any religious assembly allowed by law. (1 Wm. & Mary, c. 18, s. 18; 31 Geo. III. c. 92, s. 10; 52 Geo. III. c. 155, s. 12.)

LXXI. Fine or imprisonment.

1. Embra. (6 Geo. IV. c. 50, s. 61.)

LXXII. Fine according to the trespass.

1. Illegal distresses. (52 Henry III. cc. 1, 2, 3, 4; 3 Edw. I. c. 16.)

LXXIII. Fine and ransom at the queen's will and pleasure.

1. Judges or clerks raising rolls, changing verdicts, &c. whereby ensue disharmony of any of the parties.† (8 Rich. II. c. 4.)

2. Heads of persons holding commissions to compound for the payment of first-fruits.** (26 Hen. VIII. c. 8, s. 4; 1 Eliz. c. 4, s. 24.)

LXXIV. Grotesque fine to the queen.

1. Not being present at the summons of sheriffs and the cry of the country, to arrest felons, when need is, as well within as without.†† (3 Edw. I. c. 9.)

LXXV. Grotesque punishment.

1. Not being present at the money wrongly from successful suitors or jurors, prisoners or others attached upon place of the crown.††† (3 Edw. I. c. 30.)

LXXVI. Punishment at the queen's will.‡

1. Imprisonment by sheriffs and other queen's officers. (3 Edw. I. c. 20; 1 Hen. IV. c. 11.)

LXXVII. Fine not exceeding 100l., at the discretion of the court.

LXXVIII. Objections against the Act for abolishing the truck system in certain trades. (1 & 2 Wm. IV. c. 37, s. 9.)

LXXX. To be at the queen's will of body, lands, and goods, thereof to be done as shall please her.

1. Justices bound of the rest of the parties contained in the oath required to be taken by them. (18 Edw. III. st. 4; 20 Edw. III. c. 1.)

LXXXI. Forfeiture of twenty shillings for every offence.†††

1. Drovers, travelling to and from London or their servants travelling or coming into their inns or lodgings upon the Lord's Day.†††† (29 Car. II. c. 7, s. 2.)

LXXXII. Forfeiture of 5s.

1. Persons of lawful age, fourteen or upwards, doing or exercising any worldly labour, business, or work of their ordinary calling on the Lord's Day (works of necessity and charity only excepted).††††† (29 Car. II. c. 7, s. 2.)

Besides the offenses enumerated above, there are several offenses against the Established Church which are indictable, but the penalties for which may be relieved against by complying with the provisions of what are commonly called the Toleration Acts. These offenses consist of:

1. The forbearing to resort to one's parish church on Sundays or other holy days, without some lawful or reasonable excuse for being absent, which constitutes the offender on conviction a recusant convict, and renders him liable to forfeit 12d. for every such offence, to the use of the poor of the parish where the offense is committed (1 Eliz. c. 2, s. 14), and, in addition thereto, to pay into the exchequer the rate of 20l. for every second and other offense which shall be contained in the indictment upon which he is convicted; and also, having been once convicted, to forfeit without further indictment or conviction 20l. to the use of the poor for every fourth month of so farreaching (29 Eliz. c. 6, s. 4; 3 Jac. I. c. 4, s. 8). He also, previously to the passing of the 7 & 8 Vict. c. 102, which repealed the Acts imposing them, became liable to numerous disabilities, amounting in effect to outlawry. A Roman Catholic who so forborne to resort to his parish church, became on conviction a Popish recusant convict, and liable to additional penalties and disabilities beyond those which attached to recusants convict. The offense has, however, been repealed by the before-mentioned Act of the 7 & 8 Vict. c. 102, as regards Roman Catholics.

2. The relieving, harbouring, or keeping recusants in the house, the penalty for every month of so farreaching, which is 10l. (3 Jac. I. c. 4, ss. 32 and 33). The 7 & 8 Vict. c. 102, also repealed this offense so far as it is related to Popish recusants.

3. Schoolmasters teaching in private families without license from their archbishop, &c., and before subscribing a declaration of their conformity to the Liturgy; for which they are liable, for the first offense, to suffer three months' imprisonment, and for every second and other offense the like imprisonment, and to forfeit 5l. to the queen. (13 & 14 Car. II. c. 4, ss. 11 and 12; 1 Wm. and Mary, ses. 1, c. 8, s. 11.)

4. Popish bishops, priests, or Jesuits, saying mass or exercising any of their functions within the queen's dominions, or Papists keeping school or educating youth within the same, whereby, upon conviction, they become liable to perpetual imprisonment. (3 Jac. I. c. 4, s. 3.) Roman Catholics were also liable to many other severe penalties for promoting or exercising their religion, until these were repealed by 7 & 8 Vict. c. 102. It will be seen that the two former of the above offenses no longer apply to Roman Catholics. The two latter are, however, still in force with respect to them as well as all other classes of the queen's subjects.

The offense of forbearing to resort to church is repealed by the Protestant Dissenters' Toleration Acts (1 Wm. & Mary, ses. 1, c. 15, ss. 13 and 16; and 52 Geo. III. c. 155, ss. 4 and 14) in favour of such persons who go to public worship for religious worship, but only under provisions specified by law. Quakers, however, must also, in addition, make the declaration of fidelity, as it is called, and subscribe a profession of their Christian belief. By the provisions of the Toleration Acts, the law of religious liberty, or keeping recusants is no longer

† Lord Mansfield declared it to be the unanimous opinion of the court, that neither the Bill of Rights (1 Wm. & Mary, sess. 1, c. 2) nor any other Act had any operation against the right of the crown. (3 & 3 Wm. IV. c. 5, s. 5.)

‡ The first and second offences are punishable on summary conviction only.

§ Such offenders also forfeit double the value of the estate conveyed.

‖ The punishment by 1 Wm. & Mary, c. 18, s. 14 (12 Stat. Laws. Toleration Act), was 20l. only. As regards the former there is no doubt that 38 Geo. III. c. 155, with which however this Act of Parliament Dissenters', has superseded it; but it may be a question whether, notwithstanding the generality of its terms, it has superseded the provision of Geo. III. c. 5. (3 & 3 Wm. IV. c. 5, s. 5.)

¶ For the meaning of ransom and queen's will and pleasure, see p. 175.

† The offender and must also satisfy the party.

‡ For the meaning of queen's will, see p. 175, col. 1, note ‡.

§ Such offenders are also to pay to the complainants treble the value of what they shall receive.

‖‖ For the meaning of queen's will, see p. 176, col. 1, note ‡.
repealed in favour of Quakers who make the declaration and subscribe the profession before alluded to, and of all other Protestant Dissenters who resort to some congregation in the United Kingdom, or are otherwise indulged in the worship of Quakers allowed by law, or take the oaths of allegiance and supremacy, or (since the passing of the 3 & 4 Wm. IV. cc. 49 and 82, in case such Dissenters are on foreign service) make a declaration to the effect of such of such oaths. The penalties imposed upon schoolmasters teaching without licence from the archbishop, &c. are repealed in favour of Protestant Dissenters who take the oaths of allegiance and supremacy or (since the passing of the 3 & 4 Wm. IV. cc. 49 and 82,) make a declaration to the effect thereof, or, if Quakers, make the declaration of fidelity and profession of their Christian belief before alluded to, and make a declaration that they believe in the Scripture scriptures as received among Protestant churches. (1 Wm. and Mary, sess. 1. c. 18. s. 13; 8 Geo. I. c. 6; 19 Geo. III. c. 44, s. 2; 10 Geo. IV. c. 7, s. 1; & 8 & 4 Wm. IV. cc. 49 and 82.) Papists bishops, &c. saying mass, &c., and Papists keeping school or educating youth, are relieved from the penalties for so doing, provided they take the oath appointed by the Roman Catholic Relief Act (10 Geo. IV. c. 7). See the 31 Geo. III. c. 92, ss. 3, 4, and 18; and 10 Geo. IV. c. 7, ss. 2 and 23.

Persons committing any of the before-mentioned offences against the Established Church, may, also, in general, prevent the taking of the oaths of allegiance and supremacy, and thus of conforming to the law. Members of the Established Church are not within the Toleration Acts, and the only mode, therefore, in which they can escape the penalties for the non-taking of the oaths, is by conforming to the law. Neither do Acts apply to Jews.

There are also two offences, having, however, much more of a political than of a religious character, which subject the person committing them to be adjudged Quaker recusants convict, and as such to forfeit and be proceeded against. These are, refusing to take the oaths of allegiance and abjuration, or to make the affirmations or declarations allowed by law in lieu thereof, when tendered by two justices of the peace or other authorized persons (1 Geo. I. st. 2, c. 13, s. 10; 8 Geo. I. c. 6; 6 Geo. III. c. 53; 3 & 4 Wm. IV. cc. 49 and 82; 1 & 2 Vict. c. 77;) and peers or members of either House of Parliament, sitting or voting therein or coming into the queen’s presence, before they have taken the oaths of allegiance and supremacy, or taken or made the oath, affirmations or declarations allowed by law in lieu thereof. (30 Car. II. st. 2, s. 2, 5, and 6; 8 Geo. I. c. 6; 31 Geo. III. c. 22, s. 20; 10 Geo. IV. c. 7, ss. 2, 4, and 23; 3 & 4 Wm. IV. cc. 49 and 82; 1 & 2 Vict. c. 77.) Peers and Members of Parliament are liable in respect of the latter of these offences to many disabilities, and to a fine of £100, in addition to the penalties consequent on being adjudged Quaker recusants convict. The repeal of the four first-mentioned offences relates only to the intended Oaths, and is recommended by the Commissioners for revising and consolidating the criminal law. (See their Report on Penalties and Disabilities in regard to Religious Opinions, dated 30th of May, 1845.) The Commissioners also recommend that persons committing the two last-mentioned offences should no longer be adjudged and suffer as Quaker recusants convict, but should be punished in a more direct manner; and that one form of an oath, and one of an affirmation, should be substituted for the numerous forms of the oaths of allegiance, supremacy and abjuration, and the modifications thereof now existing, to be so framed that the same may be taken by all classes of her Majesty’s subjects without objection on religious grounds.

The whole of the law, written as well as unwritten, relating to the definition and punishment of the above offences, that is to say, the whole of Lord Chief Justice Hardwicke’s speech, generally, is comprised in twenty-four chapters and heads. 1. Preliminary Declarations and Enactments.

2. Treason and other offences against the State.
3. Offences against Religion and the Established Church.
4. Offences against Property and persons.
5. Offences against the Administration of Justice.
6. Offences against the Public Peace.
7. Offences relating to the Coin, and to Bullion, and Gold and Silver Plate.
8. Offences relating to the Public Property, Revenue and Funds.
10. Offences against Peace, War, and Necessary Prelates and Registers.
11. Offences against Public Morals and Decency.
15. Homicide and other offences against the person.
16. Libel.
17. Offences against the Habeas.
18. Fraudulent Appropriations.
19. Piracy and Offences connected with the Slave Trade.
20. Malicious Injuries to Property.
21. Forgery and other offences connected therewith.
22. Illegal Solicitations, Conspiracies, Attempts and Repetitions of Offences.
23. Definitions of Terms and Explanations.
24. Collection of evidence. Upon the subject of punishments, the Commissioners recommend the abolition of forfeiture as an incident to conviction for treason or felony; are inclined to reject whipping as a mode of punishment, except in the case of capital offenders, or of aiding fire-arms, &c. at the queen’s (5 & 6 Vict. c. 51, s. 2), in which it has lately been imposed by the legislature as constituting a signal mark of ignominy; propose that three, or at the utmost, four years should be the longest term of imprisonment to be inflicted for any offence, whether treason, felony, or misdemeanor, in cases where imprisonment forms the whole or part of the punishment; and suggest a scale of penalties, consisting of forty-five classes, to be substituted for the numerous punishments contained in the above statement. This scale might be much further reduced but for the special nature of some offences, and if the recommendations the Commissioners should be adopted. At present it is extremely difficult in some instances to determine what punishment an offence is liable to.

It may be expected that at no distant period the ‘Act of Crimes and Punishments,’ subject to such omissions as are recommended by the Commissioners, will become the law of the land. A bill embodying its provisions was introduced, at the end of the year 1844, in the House of Lords by Lord Brougham, was read a second time, and went into committee pro forma; but was ultimately withdrawn at the instance of the Lord Chancellor, who undertook to issue a commission for revising and consolidating the criminal law, and have a code of rules too laborious for any government to grapple with, and if their Report should be favourable to its adoption, to find one or more government measures upon it, as should be thought most expedient. A commission (the one most useful Report on Penalties and Disabilities in regard to Religious Opinions has been several times alluded to in the foregoing statement) was accordingly appointed for this, amongst other purposes, on the 22nd of February of the year 1845. Since, the members of the old commission (who also form part of the new one) have made a Report containing a digest of the law of procedure as regards indictable offences (a most difficult and laborious undertaking), and this also is to be revised by the new commission, and if passed into a law would be a work of inestimable value.

Besides the ‘Act of Crimes and Punishments’ and the Digest of the Law of Procedure, several other important reports emanated from the original Criminal Law Commission. It was upon their recommendation that the Acts of the 1st year of her present Majesty’s reign, repealing the punishment of death in cases between thirty and forty crimes, were founded. It was a Report of theirs which mainly contributed to the alteration of that harsh and inconsistent rule of our law which denied a prisoner his full defence by counsel unless he was charged upon a capital offence, and that engaged in the practice or administration of the law. The digestion so prepared by the Commissioners, and called by them ‘The Act of Crimes and Punishments,’ is comprised in twenty-four chapters and heads, namely:

1. Preliminary Declarations and Enactments.
2. Treason and other offences against the State.
3. Offences against Religion and the Established Church.
4. Offences against Property and persons.
5. Offences against the Administration of Justice.
6. Offences against the Public Peace.
7. Offences relating to the Coin, and to Bullion, and Gold and Silver Plate.
8. Offences relating to the Public Property, Revenue and Funds.
10. Offences against Peace, War, and Necessary Prelates and Registers.
11. Offences against Public Morals and Decency.
15. Homicide and other offences against the person.
16. Libel.
17. Offences against the Habeas.
18. Fraudulent Appropriations.
19. Piracy and Offences connected with the Slave Trade.
20. Malicious Injuries to Property.
21. Forgery and other offences connected therewith.
22. Illegal Solicitations, Conspiracies, Attempts and Repetitions of Offences.
23. Definitions of Terms and Explanations.
Providence.

Where any of the before-mentioned crimes has been or is suspected to have been committed, the ordinary mode of bringing the accused to justice is as follows:—Unless he surrender himself, he is, in the first place, to be summoned by some magistrate, having jurisdiction, to appear before him; or, as is sometimes ordered for his apprehension it is to be procured from some such magistrate. In the issuing of a summons or warrant there must be an information laid on oath: the former may be given either to the accused himself, or to some other person whom he orders to appear, the latter to any constable or other person whom the magistrate pleases, and must signify the party to be arrested and the offence for which complaint is made: until some warrant duly issued and served upon the accused, he is to appear according to its directions, or in default the magistrate may issue his warrant to apprehend him. After a warrant duly granted, where several summons have been previously issued or not, the person to whom it is directed is to proceed to arrest the accused (and if for treason, felony, or breach of the peace, may do so on any day, and at any time of the day or night), and to take him to goal or before some magistrate having jurisdiction, according to the import of the warrant, and that without any unnecessary delay. It is also lawful for a constable or private person who sees a felony committed, or attempted to be committed, to apprehend such a person or persons as he has reasonable cause to suspect to be the offender, without warrant; also any person whom he reasonably suspects of having committed a felony which has actually been committed, and persons found committing thefts or malicious injuries, without a warrant. The constable may also, without warrant, arrest on a reasonable charge made of a felony committed or dangerous wound given, although it afterwards appear that none such had been actually committed or given; also for a breach of the peace if committed in his view; but (except in the case of one of the metropolitan police, who may under certain circumstances do so upon a charge made of an aggravated assault [see 2 & 3 Vict. c. 47], not for committing such an assault), unless at the instance of the person aggrieved, without the presence of the sheriff, coroner, and all other peace officers, have, it would appear, the like power to arrest as constables. Where a party is arrested without warrant, he must be taken before a magistrate within a reasonable time.

On surrendering himself or appearing in obedience to a summons, or being brought before a justice of the peace under a warrant, the justice is to proceed to take the examination of the accused and the information on oath of those who know the facts and circumstances of the case, and is to put so much thereof as is material into writing. If a prindé face case be made out, the justice is to commit him to prison (unless he be excused to be discharged on his own recognizance, if it appear that no crime has been committed or that, if committed, the accused is innocent, he is to discharge him). Unless it be prohibited by act of parliament, the accused ought to be admitted to bail, and in the case of a charge of treason, felony, and the accused is brought before a single justice of the peace, if the evidence be neither sufficient to raise a strong presumption of guilt, nor to warrant the dismissal of the charge, he is to be detained until the case be taken before two justices at the least, who in such case may admit him to bail (7 Geo. IV. c. 64, s. 1), and, if one of them has signed the warrant of commitment, may admit him to bail, although he confessesthe matter laid to his charge, or such charge do not appear to be groundless, or the circumstances be such as to raise a presumption of guilt (3 & 6 Wm. IV. c. 33, s. 3). If the accused be brought before the justice in the first instance, they have the like power to bail him. Where a party is committed or bailed for any offence, the justice may bind by recognizance all persons who know or declare anything material touching it, to appear and felony is committed, or when he is to be brought before any justice or any court, must be examined upon the charge or before the trial, he is to be committed to the gaol of the Queen's Bench, or if in any other court or place, cannot be acquitted upon their trial, shall be discharged from imprisonment (31 Car. II. c. 2, s. 7). [I. H. 6. 5.: R. C.]

When the indictment is found, in cases of felony, the accused is bound to appear in court; such an appearance is to be brought to the bar and arraigned (which is legal term for calling on a prisoner to answer to a charge of an indictable offence). If not so conveniently served, the accused is not to be punished; but in all cases of treason, except where the overt act is the assassination of the queen, the endangering of her life or person, or any attempt to injure her person (39 & 40 Geo. III. c. 38; 5 & 6 Vict. c. 51), and except the forgery of the great and other royal seals (7 & 8 Wm. III. c. 3, s. 15), the accused is to have a true copy of the indictment delivered to him ten days at the least before he is arraigned, and, at the same time, a list of the witnesses is to be procured against him, and if indicted in any other court than the Queen's Bench, a list of the petit jury; but if indicted in the Queen's Bench, the list of the petit jury may be delivered to him at any time after his commitment. In the absence of the accused before the day of trial (7 & 8 Wm. III. c. 3, s. 1; 7 Anne, c. 21, s. 11; 6 Geo. IV. c. 50, s. 21). If the accused plead, however, without claiming or having had delivered to him such copy or list, the court shall be considered as not being his legal objection on account of such non-delivery. In cases of misdemeanor, the accused is not bound to plead and try at the session at which the indictment is found, unless he has been in gaol. In such case the accused may plead and try at the session before which he is charged, twenty days at the least, before such session (90 Geo. III. & 1 Geo. IV. c. 4, s. 3), but may traverse the indictment, that is, postpone its determination, and may, if not immediately, have the trial transferred to another court, to be allowed to do so, appear personally in court (except in the court which has jurisdiction to try parties for crimes by means of a petty jury; or in the case of murder or manslaughter, he may be tried upon the coroner's inquisition. Where the offence with which he is charged is treason, felony, or any criminal information filed against him in the name of the queen. For a præsumption, he is to be first indicted as in other cases, or may be proceeded against in the peculiar manner pointed out by 16 Rich. II. c. 5, commonly called the Statute of Pannunrime. This latter mode may, however, be regarded as obsolete.

A bill of indictment is a bill of indictment of the Crown, and being for the public benefit and security, may generally be preferred by any person; but it is not usual for parties to interfere unless they have seriously aggrieved by the offence, or fill some office which renders it peculiarly incumbent on them to bring the offender to justice. [INDICTMENT, P. C.] So soon as the grand jury have presented the bill of indictment in court, issued 'a true bill,' the indictment is complete. If the grand jury find no true bill, the accused, where in custody, is to be at once set at large, without the payment of any fees on account of such discharge (14 Geo. III. c. 20; 55 Geo. III. c. 50; 8 & 9 Vict. c. 114). An indictment may also be framed upon the presentment by a grand jury, of their own knowledge that an offence has been committed; but this mode of prosecution is seldom adopted. For further particulars relating to Grand Juries see the title. A criminal information in the name of the Queen is a suggestion filed on record by the attorney-general or by the queen's counsel or master of the Crown Office, in the court of the Queen's Bench, but to a misdemeanor in the name of an alleged offender. The attorney-general, or, during vacancy in that office, the solicitor-general, may at discretion file a criminal information. In all other cases it is in the discretion of the court of the Queen's Bench to grant or refuse leave to file such informations, and such leave will only be granted on motion made, grounded on proper affidavits, and in respect of misdemeanors of such magnitude or under such circumstances as, in the opinion of the court, call for the inter- stance. After an information is filed, all the subsequent proceedings are, in general, the same as after an indictment found for a misdemeanor.

Persons committed for treason or felony who move in open court the first week of the term, or first day of the sessions of oyer and terminer or gaol delivery, to be brought to trial, may, if not indicted some time in the next term or session after their commitment, be bailed by the judges of the Queen's Bench, or justices of oyer and terminer or goal delivery, unless it appear that the witnesses for the crown could not be produced the same term or sessions; and if not indicted and tried the second time, if after the time ordered by the law acquitted upon their trial, shall be discharged from imprisonment (31 Car. II. c. 2, s. 7). [I. H. 6. 5.: R. C.]

When the indictment is found, in cases of felony, the accused is bound to appear in court; such an appearance is to be brought to the bar and arraigned (which is legal term for calling on a prisoner to answer to a charge of an indictable offence). If not so conveniently served, the accused is not to be punished; but in all cases of treason, except where the overt act is the assassination of the queen, the endangering of her life or person, or any attempt to injure her person (39 & 40 Geo. III. c. 38; 5 & 6 Vict. c. 51), and except the forgery of the great and other royal seals (7 & 8 Wm. III. c. 3, s. 15), the accused is to have a true copy of the indictment delivered to him ten days at the least before he is arraigned, and, at the same time, a list of the witnesses is to be procured against him, and if indicted in any other court than the Queen's Bench, a list of the petit jury; but if indicted in the Queen's Bench, the list of the petit jury may be delivered to him at any time after his commitment. In the absence of the accused before the day of trial (7 & 8 Wm. III. c. 3, s. 1; 7 Anne, c. 21, s. 11; 6 Geo. IV. c. 50, s. 21). If the accused plead, however, without claiming or having had delivered to him such copy or list, the court shall be considered as not being his legal objection on account of such non-delivery. In cases of misdemeanor, the accused is not bound to plead and try at the session at which the indictment is found, unless he has been in gaol. In such case the accused may plead and try at the session before which he is charged, twenty days at the least, before such session (90 Geo. III. & 1 Geo. IV. c. 4, s. 3), but may traverse the indictment, that is, postpone its determination, and may, if not immediately, have the trial transferred to another court, to be allowed to do so, appear personally in court (except in the
Queen's Bench, where he may appear by attorney) and plead. A party indicted for a misdemeanour, not having been in custody nor out on bail, twenty days before the session at which he is so indicted, may also, at the subsequent session, traverse to the one following, unless he has been in custody or otherwise notified of such indictment, twenty days before such subsequent session (60 Geo. III. & 1 Geo. IV. c. 4, s. 5). If the accused, whether in case of felony or misdemeanour, be not in custody nor on bail when the indictment is found, the court may not on bail, make default, his appearance may be compelled by process or by a bench warrant; and he may be prosecuted to outlawry. [OUTLAWRY, P. C.] No fee is to be demanded or taken from persons charged in such a case, except by messengers as to a party acquitted, or, on an order such finding to be recorded and the prisoner to be kept in strict custody until her Majesty's pleasure be known.

When, however, the plea of 'Not Guilty' has been pleaded, the trial is to be had before some court having jurisdiction, in which the felony or misdemeanour is alleged to have been committed. If the fact is alleged in the indictment to have been committed, called a petit jury, by way of distinction from the grand jury. The ordinary courts having jurisdiction to try indictable offences are the Queen's Bench Courts of Oyer and Terminer, Goal Delivery, and Quarter-Sessions, Borough Courts and the superior Criminal Courts of the Counties Palatine; but Courts of Quarter-Sessions and Borough Courts have no jurisdiction with respect to indictable offences punishable with death or transportation for life, and several other offences (see § 5 & 6 Vict. c. 38, s. 1). The trial is generally to be had in the county or district in which the offence was committed.

Upon the trial being called on, the jurors are to be sworn as they appear, to the number of twelve, unless they be challenged. As to challenges, whether on the part of the Crown or the prisoner, and as to petit jurors generally, see JURY, P. C. It may here be observed, however, that the right of preperemptory challenge, i. e. of challenging at mere pleasure, without showing any cause, which exists in cases of treason or felony, has not been allowed in cases of misdemeanour, to distinguish those classes of crimes from misdemeanours; and that the power to challenge peremptorily to the number of thirty-five jurors in cases of treason, and to the number of twenty in cases of felony, is allowed in cases of treason and feoly, but not with respect to misdemeanours. When twelve jurors are procured from exception, and have been sworn, or, if Quakers, Moravians, or Separatists, or persons who have been impeached of perjury, declared that they will give no verdict in case of treason or felony, well and truly to try and true deliverance make between the queen and the prisoner whom they have in charge, and, in cases of misdemeanour, well and truly to try the issue between the defendant, the case, where counsel is retained for the prosecution, is to be opened by him, or, if two or more counsel are retained, by the leading one, according to his instructions, and then the prisoner is to be called as a witness. If the counsel for the prosecution ought, however, to confine himself so far as possible, to a simple statement of the facts which he expects to prove, and to abstain from any appeal to the passions of the jury, more particularly in cases where the prisoner has no counsel. After the opening, or where no counsel is engaged for the prosecution, immediately after the swearing of the jury, the examination of the witnesses on behalf of the Crown commences. Before being examined an oath or affirmation is administered to each witness that he will true answer to such questions as the court shall demand of him, and will tell the truth, the whole truth, and nothing but the truth. Witnesses are not allowed in the case of the witnesses; where there is none, that duty devolves on the court. In criminal cases a single witness, swearing to the actual offence or to such facts as necessarily lead to the discovery of that offence, is often enough. But sometimes there has been on the part of the prosecution an insufficiency of the evidence, or it is generally sufficient to substantiate the charge. In treason, perjury, and the offences of tumultuously petitioning, affirming that parliament has a legislative authority without the Crown, or that any person is entitled to the crown contrary to the Act of Settlement, and Blasphemy under the provisions of 9 & 10 Wm. III. c. 32, however, there must be two witnesses. In all cases also, the prisoner's confession, if made in consequence of a charge against him, and in a direct and positive manner, voluntarily and without promise or threat operating on his mind at the time of making it, is sufficient; even if there be no other proof that the crime with which he has been charged has been committed, for the jury to convict upon, if they believe it to be true. And the single unsupported testimony of an accomplice is sufficient (except where two witnesses are required), if the jury believe his story; but it is usual in such cases for the court to direct a jury to be returned to the court. If, however, the accomplice be corroborated by unsuspicious evidence as to such parts of his testimony as show that his story has not been fabricated, the court will not interfere. There may be exceptions to the rule that the charges may be sustained: 1st, positive, as by the direct testimony of a witness who saw the fact; 2ndly, circumstantial, when a number of facts are presented which are inconsistent with any other hypothesis than that of the accused being the person implicated for the purpose under the provisions of the 39 & 40 Geo. III. c. 94, so that he cannot be tried, the court may
When the jury have agreed upon their verdict, they signify that they are ready to deliver it; and on returning into court by the purpose, their names must be called over, and all twelve must be heard before it is given. The dispensation of the jury is the person who is to deliver the verdict; and in cases of treason or felony, it can only be received in open court; and in cases of misdemeanor, it may be otherwise. The verdict in such cases may be either 'Guilty' or 'Not Guilty,' or may be a special one; and may be 'Guilty' upon one count of an indictment, and 'Not Guilty' upon another. Guilty upon one count, and 'Not Guilty' as to the remainder, where an offence is charged which includes a lesser crime of the same degree, and the latter only is proved; as where murder is charged, and the evidence of manslaughter by the passing of 7 Wm. IV. & 1 Vict. c. 85, s. 11, before referred to, the jury may find guilty of an assault, where one is included in the felony charged, and acquit of the felony, although an assault is a misdemeanor only. A special verdict is the finding of all the facts specially, where the jury doubt whether they constitute the offence in the indictment, and leaves the court to give judgment according to the legal effect of the facts so found.

Where upon the trial evidence is given of insanity at the time of committing the offence charged, and the jury acquit, they are required to find specially whether the accused was insane at the time of committing the offence, or whether he was acquainted on that account; and if they find in the affirmative, the court is to order him to be detained till the queen's pleasure be known; and she may give such order as she sees fit in cases of insanity. (39 & 40 Geo. III. c. 94, s. 1; & 2 & 4 Vict. c. 54, s. 3.) On a verdict of acquittal, or where he is discharged by proclamation for want of prosecution, the prisoner is to be immediately set at large in open court, and the officer of the court, in respect of such discharge. (14 Geo. III. c. 20; 55 Geo. III. c. 50; & 8 & 9 Vict. c. 114.)

When a verdict of guilty has been restored against a prisoner, the court, except in the case of prosecutions pending in the Queen's Bench, may proceed at once to pass sentence upon him, unless he allege some matter or thing sufficient in law to arrest or bar his judgment. In prosecutions pending in the Queen's Bench, the prisoner is allowed four days for moving in arrest of judgment; or, in cases of misdemeanor, for a new trial or writ of certiorari facias de novo. Also where the trial at any sittings or assizes is upon a record of the Queen's Bench, the judge before whom the verdict is taken may, under 11 Geo. IV. & 1 Wm. IV. c. 70, s. 9 (except where the prosecution is by Information filed by leave of the Queen's Bench), or by the attorney-general wherein he prays that judgment may be postponed, pass sentence at once; but such sentence is not to have the force and effect of a judgment of that court, until after the expiration of the term in which the proceeding is pending, or after the ensuing term, during which period the prisoner may move for a new trial, or to have the judgment amended. Except in the last-mentioned case of a trial at the sittings or assizes upon a record of the Queen's Bench, or where the Queen's Bench is at nisi prius, the prisoner is convicted is a misdemeanor punishable by a simple fine, or where the Queen's Bench, after conviction for misdemeanor, thinks proper to dispense with his attendance, sentence cannot be pronounced against a prisoner unless he be present in court at the time. Judgment may be arrested where the offender has received a pardon since his arraignment or after conviction becomes insane, or, having been out of custody since his conviction, denies that he is the person convicted (in which last case a jury is generally impaneled to try the fact), or for some defect apparent in any part of the record, as regards either the jurisdiction or the constitution of the court or proceedings thereon, but not for any of the mere technical defects specified in 7 Geo. IV. c. 64, ss. 20 and 21. If the judgment be arrested, all the proceedings against him are to be held in abeyance; and if the court, after an inquiry into the facts, be of opinion that the defendant is insane, or if the proceedings be arrested on any other ground, the defendant is to be committed, and the judge is to pronounce in his favour; but he may be prosecuted again for the offence of which he is so acquitted.

A new trial may be ordered upon the application of the defendant in all cases of misdemeanor pending in the Queen's Bench, where it appears to the court that the awarding one is essential to justice; as, for instance, where the verdict is contrary to the evidence or the directions of the judge; where it has been improperly received or rejected at the trial. The court of Queen's Bench will also in its discretion, where a party is
acquitted of a misdemeanor on a prosecution pending in that court, allow a new trial, on the application of the prosecutor, if such acquittal has been obtained by any fraudulent means of his choice, where the party acquit has kept back any of the prosecutor's witnesses, or neglected to give due notice of trial.

A writ of venire facias de novo, the effect of which is the same as in a new trial, may be awarded where, by reason of misconduct on the part of the jury, or of some uncertainty or ambiguity or other imperfection in their verdict, or of any other irregularity or defect in the proceedings or the appealing on the record, the proper effect of the first venire has been frustrated, or the verdict has become void in law.

Neither new trials nor writs of venire facias de novo are grantable in cases of treason or felony.

Where a new trial or writ of venire facias de novo is awarded, the parties stand in the state in which they were immediately before the first trial: the whole case is to be re-heard, and the first verdict cannot be used upon the new trial, or as evidence of any matter found by such verdict, or in argument.

After sentence pronounced against an offender, the judgment of the court may be falsified or reversed, either by plea without writ of error or by writ of error: by the former, for some matter not apparent upon the face of the record, as want of authority in the court by whom the judgment was pronounced; or for some matter not appearing on the record, the proper effect of the judgment itself. Where the judgment has been pronounced by a court of oyer and terminer, gaol delivery, or quarter sessions, or of a county court, the writ of error is to be brought in the court of Queen's Bench, and for that purpose the indictment and other proceedings thereon must be removed into that court by writ of certiorari [CERTIORARI, F. C. 1. c. 3. s. 1.]; where it has been pronounced by any other court, it is to be brought in the Exchequer Chamber, before the justices of the Common Pleas and barons of the Exchequer, from whose judgment a writ of error lies to the court of Queen's Bench.

In cases of treason and attending is the discretion of the crown to grant or refuse a writ of error: in all other cases the right of the attorney-general must be first obtained, and this he ought to grant upon probable cause of error shown. When issued, the writ of error stays the execution of the judgment, where it has not been carried into effect during the time that such writ is pending, except that in cases of treason or felony the offender is not entitled to be liberated on bail. In cases of misdemeanor, however, where he is imprisoned under execution, or any fine has been levied, either in whole or in part in pursuance of the judgment, he is entitled to be discharged from imprisonment and to receive back any money levied, or the amount of a determination of the Writ of Error. (8 & 9 Vict. c. 68, s. 1.)

If the judgment be falsified or reversed, such judgment and the fine or pecuniary punishment, and all former proceedings, become thereby absolutely null and void. A judgment against whom is so falsified or reversed, if living, and, if dead, his heir or executor, is restored to all things which such person may have lost by such judgment and other proceedings, and stands in every respect as if such person had never been charged with the offence in respect of which such judgment was pronounced against him. If, however, the execution only be erroneous, that only will be reversed; and if the judgment be reversed for some technical error merely, in the indictment or subsequent process, the party may be prosecuted again. If the judgment be confirmed, the prisoner is to undergo the remaining punishment.

Where there is nothing to arrest or bar a judgment, the execution of it may be prevented by a pardon received after sentence pronounced; but, without express words of resituation, such a pardon, unless it be put in his court or the execution or attinder, is thereby revoked in him; nor, unless where the pardon is by act of parliament, is the corruption of his blood removed, except as regards those of his blood born after the time such pardon, or the consequences of such previous corruption prevented.

In capital cases the execution of a judgment may also be suspended by a reprieve, either at the discretion of the Crown, or by the order of the courts of justice requires it. There are two instances however in which the court is bound to grant a reprieve, viz: 1, where the offender, if a female, is pregnant; 2, where the offender becomes insane after judgment.

The prisoner alleges that she is pregnant or the court have reason to suppose that she is so, a jury of twelve matrons is to be impannelled with all possible dispatch to try whether or not she be quick with child. In case they find in the evidence that the prisoner has kept back any of the prosecutor's witnesses, or neglected to give due notice of trial.

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observed, be put upon his trial until a true bill has been found against him by a grand jury, and cannot be convicted except by the verdict of a petit jury: to have made all these minute offences punishable by indictment upon the class of persons qualified to serve as jurors a frequency of attendance which would have been found to be most troublesome and harassing. Accordingly numerous acts of parliaments of the peace or persons the power to try parties accused of trifling offenses without the intervention of a jury. The extension of the mode of proceeding has been always regarded with extreme jealousy.

Where an offence punishable on summary conviction before a justice of the peace has been committed, or is suspected to have been committed, the attendance of a jury is dispensed with as follows:—An information (but which need not be in writing unless directed to be so by the statute which creates the offence) is to be laid before the justice authorized to take such information, who thereupon issues a summons to the party complained of, containing the substance of the charge, and giving him notice that at a certain time and place the hearing of the complaint against him will be proceeded with. If the party attend at the appointed time and place, and confess that he has committed the offence, the justice proceeds at once to convict him, and to impose the penalty assigned by the Act which creates the particular offence. If he attend, but deny the commission of the offence, the party in whose favour the evidence is to be gone into for the purpose of showing that he has committed it. In the latter case, however, it must be first ascertained that he has been duly summoned. It appears that in this recent legislation, all such cases are in the presence of the party complained of, where he appears; and generally, all rules applicable to the trial of indictable crimes must be considered as applied to the trial of offences punishable on summary conviction, so far as such rules are capable of being brought with that mode of proceeding. If, after hearing the evidence, the justice is of opinion that the charge is not substantiated, the party accused is to be acquitted. If, on the other hand, he thinks that it is, he is to convict the offender and to impose upon him the assigned penalty. Upon conviction the justice usually issues his warrant to apprehend the offender, in cases where corporal punishment is to be inflicted upon him, or else to levy the penalty incurred, by distress and sale of his goods. This is the general mode of proceeding, as well where the conviction is required to be before two or more justices, as where it may be before a single justice of the peace; but for particulars recourse must be had to the several statutes creating the offences or inflicting the punishment. In some cases a power of appealing to the quarter-sessions is given to the party aggrieved. But the mission of the justice in the subject is as follows:—The principal authorities besides the statutes of the realm which have been consulted in the preparation of this article, are Hawkins's Pleas of the Crown; Blackstone's Commentaries; Russell, On Crimes and Misdemeanors; Chitty's Criminal Law; Starkie's Treatise On the Law of Evidence and On Criminal Pleading; Dickerson's Guide to the Quarter-Sessions, by Talfourd; the 4th, 5th, 6th, 7th, and 8th Reports of the Criminal Cases; Commissioners: The Records of the Commissioners for revising and consolidating the Criminal Law, on the subject of Penalties and Disabilities in regard to Religious Opinions; and Hulton On the Law of Conveyance.

LEASE. A lease, or letting, is sometimes called a Demise (denisiis). It is sometimes said that Lease is from the Latin locatio, but as the verb which corresponds to the noun Location, the word Lease, in certain cases, is entailed upon the verb Let. The verb Let is akin to the French laisser and the German lassen.

He who lets land is called the Lessor, and he who to whom land is let is called the Lessee.

There are various legal definitions of a lease. A lease has been defined as a conveyance of lands or tenements from lessee to lessee for life, or for years, or at will, generally in consideration of a rent or reversionary interest. A lease is generally spoken of as a conveyance from one individual to another, without the consent of a particular lessor, and the lease is said to arise by a contract between the lessee and the lessee. The reservation of a rent is not essential in a lease; but payment of rent is now the chief condition on which lands are let.

To constitute a lease, it is necessary that the lands must be let for a less time than the period for which the lessor has an interest in the lands demised. If a man parts with all his interest in the lands or tenements, the conveyance is an assignment [Amendment, P. C.], and not a lease. The relation of lease from one lessor to another lessor of the same lands is usually expressed by the phrase landlord and tenant. The lessor has a reversion in the lands which are demised, that is, the expiration of the time for which the land remains his. The lessee, by virtue of this reversion, signory, or lord's title, has the power of distraining on the land for the rent which is agreed on, and for the services which may be due by the terms of the lease, and failure of payment of rent is a breach of the lease. [EsKULL, P. C.] The ordinary lease is that for a term of years, by which lease a rent, generally payable in money, at stated times, is reserved to the lessor. These stated times are usually quarterly periods.

The words used in a lease for the purpose of conveying that interest in the lands which constitutes a term of years are 'dimess, grant, and to farm.' These words are derived from the law-Latin expression 'demiiss, concessi, et ad firmam tradidi.' The word 'firma, farm, is said to signify originally 'provisions,' and 'to farm let' does not properly signify to let to be farmed, in the modern sense of the term, but to let on the condition that the tenant has certain leases of an annual or ordinary farm, that is, in provisions. If this explanation is correct, a 'farmer' is one who had the use of lands on condition of paying a 'farm' or rent in provisions, such as corn and beasts. But the word 'farmer' signifies another person, which a man hires to cultivate upon the payment of a rent.

The interest which a man acquires in land by a lease for years is a term of years, or an estate for years. [Estate, P. C.] The word lease is used in common language also to signify the estate or interest which the lessee acquires by the lease; but the word lease signifies properly the contract or conveyance by which the lessee acquires the interest in the lands.

The words 'demeis, &c., above mentioned, are the proper words to constitute a lease for years: but any words are sufficient, which clearly show the intention of the parties that the one shall divest himself of the possession of the land, and the other come into it for a determinate time.' When the written contract is not intended to be a lease, but an agreement for a future lease, it is often difficult to determine whether the contract is not so expressed as to make it a lease.

At common law, it was necessary for the lessor to enter on the lands in order to make the lease complete, and no writing was necessary. But the Statute of Frauds (20 Car. II. c. 3, § 1) enacted, that all leases, estates, interests, of freehold or terms of years, created by livery and seisin [Easomment, P. C.] only, or livery in possession and not in fee, should be in writing, and shall be enforceable only by the party making the same or their assigns, or by the parties so making the same or their agents thereunto lawfully authorized by writing, shall have the force and effect of leases or estates at will only, except leases not exceeding the term of three years from the making thereof, in which the rent reserved to the landlord during such term shall amount to two-thirds at the least of the full and improved value of the thing demised. A deed is not necessary to constitute the writing a lease, unless the tenement is an incorporeal hereditament or a reversion or remainder. But leases are generally made by deed, because covenants can be made only by deed. [Dexter, P. C.] The word 'lands,' which refers to the subject matter of a lease, comprehends what is upon the lands, as houses and other buildings, though houses and buildings are generally mentioned specifically in the lease.

The law of leases extends a great number of rules, which may be conveniently reduced to the following general heads:
tain, in order that the lease may be most beneficial to the landlord and the tenant, and by consequence to the public generally.

The subjects of leases are houses and buildings of all kinds, cultivable lands, and mines. Many persons who have not the complete ownership of houses and lands are enabled to grant leases under particular powers; and there are many statutes and in particular clauses of leases are either restrained or restricted to the granting of leases, such as Bishops, Deans and Chapters, and others. [Beveridge, P. C.]

The kind of leases of which we shall treat here are farming leases, which grant to the farmers the right to cultivate the land, and to have full power to grant them on such terms as they please. The particular form of such leases, as already intimated, is a matter that belongs to the subject of public economy, and it is almost beyond the province of direct legislation to make improvements in that mode, there would be a fresh capital applied to the cultivation of the land, with all the improvements of modern husbandry. It is contrary to experience and to all reason to suppose that a good farmer will apply his skill and capital to improvement of another man's property, unless he has the security that he will be renumerated.

The improvements which would follow from a good system of leasing would be the abolition of the evils which now exist in consequence of uncertain tenure and of bad leases. It is affirmed by the best authorities that the amount of capital which is now applied to the cultivation of the land in England is much less than it was, and that it is not sufficient capital to improve their lands, nor the necessary skill and enterprise; and it is maintained that these evils are mainly owing to the want of a sufficient security of tenure or the want of the power in the lessor to enforce, to the usual restrictions with which many of them abound.

It has been said, and truly enough, that there is no advantage to the landlord in granting a lease to bad cultivators, and that there are many such. Such a lease would not indeed be of any advantage to the farmer himself or the community in general; but he who has land to let, and will let it on terms that are mutually profitable to the landlord and the tenant, will be much more likely to get a tenant of skill and capital than he who gives the farmer an uncertain tenure or binds him in the fetters of a bad lease.

The preservation of the game and the enjoyment of the pleasures of the chase, or of the profits derived from the wild animals, is another object which some landlords secure by their lease with as much minuteness and strictness as they do their rent. [Game Laws, P. C. S.]

Thus, in addition to getting a rent from his land, the landlord often wishes to command the votes of his tenant and secure his game. With reference to these objects and certain other imaginary advantages, which are produced by directing mode of cultivation, he has a lease drawn up with conditions upon restrictions, penalties, and feudal services, which no care on the part of the farmer can prevent him from breaking in some part, and which particularly prevents the landlord from being able to enforce the best and most uncontrived feeling would consent to sign. Specimens of such leases have been printed and circulated. One of them appeared in the 'Leicester Chronicle' for June 28, 1845. This lease is a specimen of the kind which is absolutely inconsistent with good farming. The landlord in such a lease directs the tenant how he must cultivate the land. If the directions which the landlord gives comprehended the best modes of cultivation, they would be unnecessary if he had a good tenant, and they would not be observed by a bad one. A good tenant with sufficient capital will farm the land according to the system best adapted for the land, and he will be ready to avail himself of improvements. A good tenant, whether he has capital or not, will not farm well simply because he is prevented from doing some things and bound to do others; for farming, like other matters, consists not only in doing well what it is lawful to do, but in doing it well, even if the law restricts, if enforced at all, can only be enforced by constant supervision, and must be an endless source of trouble and dispute.

But most farming leases are often copies of old leases, made in other days, and are unsuited to the present state of agriculture. The things which they require not to be done and those which they require to be done, are often inconsistent. The farmer often depends on having a certain piece of land to cultivate, out of which he may be turned on a short notice, will not be an independent voter. Nor can the landlord expect to have a good tenant who will improve his land and a political tool at the same time. The uncertainty of the tenure will prevent a man of skill and capital from investing his money upon so uncertain a return. There may be many cases in which the personal character of the landlord and his promise to guarantee to his tenants that his property will not be disturbed in the possession of the land, even where he has no proper lease, so long as he cultivates it fairly and pays his rent.

But the most intelligent landlords themselves admit that the only proper tenure of the tenant is that of a lease for a determinate period; and it is on this condition alone as a general rule, that a landlord can get men of capital and skill and induce them to cultivate the land. Leases of this kind, which are unanswerable, that if lands were let to farmer tenants on leases for a determinate number of years, and on conditions which should not interfere with the land being cultivated in the best mode, there would be a fresh capital applied to the cultivation of the land, with all the improvements of modern husbandry. It is contrary to experience and to all reason to suppose that a good farmer will apply his skill and capital to improvement of another man's property, unless he has the security that he will be renumerated.

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interest is one of the reasons why many of these absurd leases still exist.

There can be no principle in the letting of land, if the object is simply to secure the best rent to the landlord and the permanent improvement of the land, his different interests in the farming of any other piece of property. The good farmer hires land to cultivate, with the hope of deriving profit from the application of his skill and capital. He does not want the tenant to be a rival farmer, but a race of farmers whose interest it is to turn the land to his own advantage. The first object of the landlord is to get as much rent as his land is worth, and to secure its against deterioration during the tenant’s occupation. The terms of the lease, then, must be so framed that, in the interests of the landowner, the observance of such conditions as are found by experience and known to practical agriculturists to be necessary to secure the permanent value of the landlord’s land. It is admitted by all reasonable people that the landlord should have ample security by the lease for his land being given up to him at the end of the lease in as good condition as he gave it to the tenant. The tenant wants no directions from the landlord, and no conditions in his favour, beyond the simplest conditions of being allowed to cultivate the land in the best way that he can for his own profit during a period sufficiently long to secure him a return for his outlay, and he acknowledges that he has no right to demand, or to insist that the landlord, if they insist on many conditions as necessary to secure their permanent interest, which a good farmer would object to as not necessary for that purpose, and also as inconsistent with the system of farming. If the framing of such a lease as we have described in general terms, must be the joint work of intelligent and liberal landlords and of good tenant farmers. It may require some time, some more experience, and suggestions from many quarters before such a lease is got into the best form. But it is an object which the consideration of all persons interested in the cultivation of the land, and the attempt has been made already. We have seen, in the Vale of Evesham Agricultural Association, which has been circulated for the purpose of obtaining the suggestions of competent persons.

It has been said that some farmers do not care for having long leases; they are willing to go on as they have done. But can it be shown that there is a number of intelligent farmers with capital who prefer a yearly tenure to a lease of reasonable length? Besides, some of these agreements for a tenancy from year to year contain restrictions almost as numerous and absurd as those in leases for a term of years. If the farmer is not to permit the farmyard manure and so increase his crop of corn, he would ask the farmer for buying them where he could get them cheapest, in order that he might have a greater return for his outlay, and this at the same time, without an increasing crop of manure, which is the result of a fair contract between farmer and landlord, these are not the men to improve our agriculture; these are the men with little capital, and less skill, who are the chiefstay of the easy temper and good nature of an indulgent landlord, and are taught that they and their labour must be protected from foreign competition. The intelligent farmer with capital seeks no protection against the foreigner, and wants no indulgence from his landlord. He is ready to give, and he would be compelled by competition to give, to the landlord the full value for the use of his land, and he would ask for no more than the liberty of cultivating it in the best way.

Before, however, a good farmer could enter on the land with full confidence, he would have one favour to ask of his landlord; and that would be, not to protect him. If he were to provide for an expense of he would be compelled by competition to give, to the landlord the full value for the use of his land, and he would ask for no more than the liberty of cultivating it in the best way.

In 1845 an act was passed (8 & 9 Vict. c. 194) entitled ‘An Act to facilitate the Granting of certain Leases.’ Its object is to substitute abbreviated forms for those now in use, and it is provided that in taxing any bill for preparing and executing any deed under the act, the taxing officer, in estimating the proper amount to be charged as the tax on the length of such deed, but only the skill and labour employed, and the responsibility incurred in the preparation thereof. It is enacted in section 4, ‘That any deed or part of a deed which shall fail to produce the effect by virtue of this act, shall nonetheless be as valid and effectual, and shall bind the parties thereto, so far as the rules of law and equity will permit, as if this act had not been made.’ There are schedules to the act,
LEA

one of which gives, in column 1, short forms of expression which may be used in place of the ordinary expressions in leases, which are contained in column 2; and it is enacted by section 1, 'That whenever any party to any deed made according to the said schedule of the act, or to any other deed which shall be expressed to be made in pursuance of this act, shall employ in such deed respectively any of the words contained in column 1 of the said schedule, as agreed, or so far as may be put in accordance by any number therein, such deed shall be taken to have the same effect and be construed as if such party had inserted in such deed the form of words contained in column 2 of the same schedule, as if the same had been inserted in that form of words employed by such party; but it shall not be necessary in any such deed to insert any such number.' 

This act does not extend to Scotland. The amount of words saved by this act is not sufficient to compensate for the difficulties that may arise from persons using the abbreviated forms in cases where they may not intend them to have the full meaning which this act gives to them. He who wishes to guard himself either as landlord or tenant by suitable covenants will do better to express his meaning at full length, without availing himself of the abbreviated forms which this act invites him to use.

Legal terms require either an ad valorem stamp or the common deed stamp, without which the instrument cannot be given in evidence. Leases for a term determinable on a life or lives not exceeding three, and the leases of all ecclesiastical corporations, whether aggregating or not, for any term not exceeding twenty-one years, are exempted from the duty.

There is also a stamp duty on agreements for leases. This is one of the many modes of taxation.

LEASE, in Scotland. [TACK, P. C. S.]

LEASE AND RELEASE. [RELEASE, P. C. S.]

LEASE, ACTION, PRINCIPLE OF. [ACTION, P. C. S.]

LEATHER. An account of the chemical processes by which the skins of animals are converted into leather is given under TANNING, P. C. p. 67; and under LEATHER, P. C., p. 140. In the former, the subject is treated in general terms, and the latter concerns the leather manufactured. The present article treats of the subject of curing and leather-dressing.

In the interesting lecture 'On Tanning and Leather-dressing,' read by Mr. Arthur Akin before the Society of Arts in 1850, and published in the fifteenth volume of the Society's Transactions,' pp. 192-214, is a notice of the principal kinds of skin which are converted into leather, and of the chief uses to which each kind is applied. From this we may conclude a few particulars illustrative of the wide range of the leather manufacture, from which it will be seen that the processes for different departments of the leather manufacture must be exceedingly various. Commencing with the larger and thicker skins, Mr. Akin observes that among those of oxen, technically known as hides, those supplied by bulls are thicker, stronger, and more elastic than those of cows, while the hides of bullocks, or castrated oxen, are intermediate between those of the bull and the cow. He states that the thickest and most substantial leather now in use is that made from the hides of the bull-wild cattle of South America. Such leather is employed for the soles of boots and shoes; for most parts of harness and saddlery; for making leather trunks, buckets, hose for fire-engines, and pump-valves; for the thick belts used in military accouterments; and for the gloves of cavalry. The thick buff-leather formerly used as armour, and which was pistol-proof, and would resist the edge of a sword, was made from the hide of the urus or wild bull of Poland, Hungary, Siberia, and South Russia, and the animal itself being called buffle, whenever the common name of the leather made from its hide. The skins of calves, though thinner than those of cows, are thicker than most other kinds of skins; they are made either by the tannin or sole, for the tanner. They are traced [TANNING, P. C., p. 40] for the use of bookbinders, and are tanned and cured for the upper leathers of boots and shoes. Akin states that it was formerly customary, in the southern part of England, to tan the hides of the celebrated Limerick gloves made of the exceedingly fine and delicate skins of the unborn calves. The practice is however, he adds, now almost discontinued, so that there are not much paper or manufacture refined upon them. For, in	

a considerable supply as coming from the Cape of Good Hope, vary much in quality. 'A long fleece, observes our authority, 'always indicates a thin skin; much of the jelly laid up in that organ being, perhaps, the material from which the leather is made. The antimony is a critical remark that 'as soon as a sheep has been sheared the air comes in contact with the cuticle, checks the perspiration and expenditure of the skin, and allows the jelly to accumulate; which is hardened by a further process of distilling, and with long fleeces are driven up to London from the distance of a few days' journey, and if part of them are slaughtered immediately on their arrival, the remainder are sheared and also tanned; and although as is unnecessary, they will be twice as thick as that of the former.' 

When simply tanned, sheepskins are employed for inferior bookbinding, for leathering bellows, and for various other purposes for which a cheap leather is required. All the white-leather, as it is termed, which is used for whip-lashes, bags, aprons, &c., is of sheepskin; as are also the cheaper kinds of scath-leather, of which brushes, gloves, under-white, and other articles of dress are made. Mock or imitation morocco, and most of the other coloured and dyed leathers used for women's and children's shoes, carriage-linings, and the covering of stools, chairs, sofas, writing-tables, &c., are also made of sheepskin. Lambskins are most generally dressed white or coloured fawn; and those of goats and kids supply the best qualities of light leather, the former being the material of the best morocco, all other skins, while kid and coloured are, however, chiefly in use for those of goats, skinned and sometimes gilt, was formerly used as a hanging or covering for walls. [TAPASTRY, P. C., p. 68.]

DEER and antelope skins, shorn or dressed in oil or tallow, are used chiefly for riding-breeds.

Shamoyed leather breeches were formerly very much used, especially in the army, and as English shamoyed leather was in high repute, it was used not only in the clothing of our own army, but also by the cavalry of Prussia and most of the other German states. During the Peninsular war it was discovered that the health of the British cavalry was seriously affected in wet weather by their leather breeches, which, in the intense cold and wet which chilled the men, and rendered them liable to rheumatism and other diseases. Woolen cloth was accordingly substituted for shamoyed leather in this article of dress, first in the British, and subsequently in the Austrian and French armies, and this change has effected a great decline in this branch of the leather manufacture. Horse-hides, which, considering their size, are thin, are tanned and curried, and are used by the harness-maker, especially for collars; and occasionally, when pared thin, for the upper leathers of ladies' walking shoes. Dog-skins are thick and tough, and make excellent leather; but Akin finds that they are entirely covered with the hair, and have fallen off so much of late years as to be nearly extinct, dog-skin leather has been in a great measure superseded, as a material for dress shoes, by horse leather, the skin of the horse being ulcerous, and inferior to that supplied by dog-skins; and hog-skins afford a thin but dense leather, which is used exclusively for covering the seats of saddles. 'It comes,' Akin states, 'from Scotland and Yorkshire; for, though hogs are abundant in every part of the country, the general custom of cooking pork with the skin on greatly restricts the supply.'

Referring to TANNING, P. C., for an account of the processes by which hides and skins are converted into leather by tanning, tawing, or shamoying, we may here notice some important observations on the subject quoted by Dr. Ure, in the Supplement to his Dictionary of Arts (art. 'Leather,' p. 147), as printed at the order of the Franklin Institute, in February, 1843. Mr. Lee expresses his belief 'that much of the original gelatine of the hides is never combined with the tannin, but is wasted; for he thinks that there is in the 100 parts of gelatine the weightless, a trancerous matter, should, on chemical principles, afford at least 180 lbs. of leather.' He believes the usual mode of preparing the hides for actual tanning, called the lining and tawing, or the mastication of the skins while in a cold state, under TANNING (p. 37), is this usually done either by steeping the hides in a solution of lime, or by placing them in a close heated chamber until the epidermis is loosened by insensible perspiration, a subject on which the preceding treatise, compiled by a process termed sweating, which is employed in Germany, and consists in laying the hides in a pack or pail, covered with tan, to produce fermentative heat. All of these plans, but
chief operations of the rectangular cutter into four. Of these the first is
styled 'dipping the leather.' It consists in moistening it with water, and beating it well upon a strong hurdle of basketwrigs, or a kind of trellis-work of wooden spars, with a mallet, or with an instrument called a mace, which may be described as a large mallet, with a cubical head, to which are inserted four egg-shaped pegs of hard wood, turned smooth and polished, that they may not tear the softened leather.

After this beating, by which the stiffness of the hide or skin is destroyed, it is spread over the inclining side of a clean table, cleaned, and wherever it is too thick, pared or shaved down on the flesh side, by the careful application of various two-handled knives; and then thrown again into water, and well secured by rubbing it with hair soap, or by placing it the one way with a piece of many gossips, or with a piece of fatty girt, by which means the bloom, a whitish matter which is found upon the surface in tanning, is removed. The second process, according to Dr. Ure's division, is the rubbing of the leather with a wooden instrument called the pommel (French, manuauel), which, he states, is so called because it clothes the palm of the hand, and performs its functions. It is a rectangular piece of hard wood, about twelve inches long and five broad, flat on the upper surface, which is provided with a leather strap, fastened at both ends, to secure it to the hand of the workman, and somewhat rounded or convex on the lower surface, which is covered with triangular grooves. This instrument, when applied to severe parts of the skin, with grooves of various degrees of fineness, and also, for some purposes, pommels of cork which are not grooved at all. In using the pommel, the object of which is to give grain and add appearance to the leather, is first applied to the flesh side inwards and rubbed strongly with it; and subsequently it is rubbed with the pommel upon the grain side, without being doubled or folded. Third in order he places the scraping of the leather with tools applied nearly perpendicular to its surface and worked forcibly with both hands, to reduce such parts as may yet be left too thick for a uniform substance; and he notices as the fourth operation the dressing of the leather with the round knife (French, tafete), a singular instrument shaped somewhat like a saucer, with a cutting edge, and with a hole in the centre for introducing the hands of the workman.

It is usually from ten to twelve inches in diameter, with the central hole about four or five inches. This tool is applied with its concave side downwards, and with it, the leather is stretched over a cylindrical wooden beam, the currier dexterously parts off the cosier fleshly parts of the skin.

In addition to these operations, which cannot be minutely explained without going too much into detail, the currier uses occasionally polishes of smooth wood or glass for rubbing the surface of the leather; and, when the leather is intended for the use of the shoemaker, he applies to it some kind of ready composition called dubbing (daubing) or stuffing. This is frequently done before using the pommel, and Dr. Ure states that the skins or doe-skins in cod-oil. As, however, his account is less distinct than that of Hebert (Engineer's and Mechanic's Encyclopedia, vol. ii. p. 71), we shall follow the latter, presuming that the reference is to the dressing of the leather for the upper parts of shoes or boots. On receiving the calf-skins from the tanner, the currier first, according to this authority, removes the offal parts, such as the head, tail, and shanks, which operation is termed rounding the skin. It is then soaked, shaved, and secured as above described, in the course of the second of which operations the currier frequently examines every part of the skin, testing its thickness by passing it double between his fingers. After being thoroughly cleaned, and distended while thus in a wet state, the skin is stuffed. Hebert states, 'with a mixture of two parts cod-oil, and one part tallow, called dubbing, which is applied to both sides of the skin.' After the oil and tallow have been applied, he adds, 'hung up to dry, by which the moisture evaporates, and the oil, which cannot be dissipated by mere exposure, gradually takes the place of the moisture, and sinks deeply into the substance of the skin. The second operation of this operation, and is succeeded by whitening, or lightly shaving the flesh side over again, by which it is thoroughly cleansed, and brought to a proper state to receive the colour used in waxing.

The coarse part of the skin is again rubbed with the pommel a second time, which brings it to the state of finished russet, in which state it can best be preserved until wanted for use. In the operation termed waxing, a colour or blacking is melted into the tallow already immersed, and rubbed well into the flesh side with a hard brush, the grain side being carefully kept clean. A coat of strong size and

<table>
<thead>
<tr>
<th>Mode of Tanning</th>
<th>Animal Matter</th>
<th>Vegetable Matter</th>
</tr>
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<tbody>
<tr>
<td>Quickly, by infusion of galla</td>
<td>61</td>
<td>30</td>
</tr>
<tr>
<td>by solution of casuchi</td>
<td>60</td>
<td>20</td>
</tr>
<tr>
<td>by infusion of Leicester willow</td>
<td>73</td>
<td>5</td>
</tr>
<tr>
<td>by infusion of oak-bark</td>
<td>73</td>
<td>2</td>
</tr>
<tr>
<td>Slowly, by infusion of Leicester willow</td>
<td>87</td>
<td>13</td>
</tr>
<tr>
<td>by infusion of oak-bark</td>
<td>86</td>
<td>15</td>
</tr>
</tbody>
</table>

The time occupied in the first four cases of quick tanning is stated to be three months. Dr. Ure adds that sole leather generally contains no less than 40 per cent. of vegetable matter. The inner white part of every astrigent bark, or that which lies next to the leather, contains the most astrigent matter, and the largest quantity of tannin, and the middle coloured part the largest quantity of extractive matter, while the outer surface or epidermis seldom furnishes either tannin or astrigent matter; and as young trees abound most in the white cortical layers, it follows that they are more productive of tannin, in proportion to the comparative weight of the bark, than old trees. The different qualities of leather made with the same kind of skin, Dr. Ure observes, 'seem to depend very much upon the different quantities of extractive matter it may have absorbed.' The leather made with infusion of galla, he adds, 'is generally harder and more liable to crack than the best boiled; but, according to Dr. Ure, apparently contains a much larger proportion of tannin, and a smaller proportion of extractive matter.'

Currying is the general name given to the various operations performed on the leather, by which the requisite smoothness, lustre, colour, and suppleness is imparted, to adapt it to the various purposes of the shoemaker, the coach and harness maker, the upholsterer and other purveyors. In the case of leather intended for soles, or such coarse purposes, is generally cured before being delivered to the workman who finishes it, dividing the

especially the latter, are said to be injurious to the hide. *" The term *tanning* is thus explained by Dr. Ure: 'Tanning is a process analogous to that described in TANNING under the term raising, consists in steeping the hair hides in a solution of pigeon's dung, containing, Mr. Lee says, mucilage of ammonium and of tannin. Marnham also mentions ammonium of ammonia and lime, with urate of ammonium, and very fermentable animal matter. Dry hides are often softened by the operation of the fulling-stocks, which has the effect of opening the pores of the hide, where a spirituous liquor, or other fermenting fluid, is added, care must be taken that the fulling or beating be not too violent, in which case it would make the hide too limber and thin. Mr. Lee conceives that the liming process is injurious to the hides. In consequence of this process, the hair is found to be very loosened by the mere softening effect of moisture, without fermentation. In quoting Mr. Lee's observations Dr. Ure makes no remark on the enormous amount of the increased weight which such wet hides appear to suffer in consequence of taking up moisture: it is not the least of Mr. Lee's observa- tion or upon the circumstance that a great increase of weight by the addition of vegetable matter has been shown by himself (TANNING, P. C., p. 88) to be a disadvantage. In order to judge of the efficiency of the process of tanning by comparing the weight of the tanned with that of the untauned hide, the relative proportions of animal and vegetable matter in the finished leather must be known. In illustration of this very important point, we may enter into a table to form the results of an analysis of specimens of calf-leather tanned in various ways, as given by Dr. Ure in the Dictionary of Arts (not the Supplement), art. 'Leather,' p. 768. |
tallow is then laid on with a soft brush, after which the surface is rubbed with a smoothing-glass. The finishing gloss is given by a little thin size laid on with a sponge, after applying which 'the skin is laid up to dry and incorporate,' according to Mr. \textit{S.} and Saint of London. The allowance is rubbed on lightly over the surface. 'The skin is thus,' he adds, 'completely finished for the consumer; and leather so dressed is found superior in appearance and durability to any other method.'

Leather is occasionally dressed 'black on the grain,' or having the hair or grain instead of the flesh side coloured. The currying operations in such a case are similar to those already described, but the first blacking is applied to the red skin immediately after scouring, by rubbing it with a solution of copperas. A brush dipped in stale urine is then passed over the surface, and an iron slacker is used to make the grain come out as fine as possible. It is then stuffed with oil, and, when dry, seasoned, or rubbed over with a brush dipped in copperas-water, on the grain, until it is perfectly black; after which it is slipped with a gristone, to remove any wrinkles and smooth down the coarse grain. The grain is finally raised by repeatedly rubbing over the surface, in different directions, with the pommel or graining-board.

One of the most singular operations in the working of leather, which may be noticed here as an illustration of the peculiar properties of the material, and of the power of the currier over it, is the mode of covering the roofs and upper pannels of coach-bodies, of which an interesting description is given in 
\textit{Black on the Grain in a Coach-factory.}' In this operation, which is only performed upon the higher class of carriages, the whole of the roof and upper part of the front, back, and sides, is covered with a single layer of the best skin, one for the roof, one for each side, and so on, but made to fit closely in every part to the work-work without any joints or divisions, and without showing any folds or wrinkles. 'To accomplish this apparently impossible feat, the hide, which is very large, and of sound quality, is, to quote from the paper referred to, 'first thoroughly moistened throughout and thrown over the top of the coach, the edges having been sewn on all sides. The currier then runs it or presses it down all over the roof, until it lies close and even in every part. He next proceeds to one of the sides, and in like manner rubs and scaprs the leather till all irregularities disappear. 'A little consideration,' observes the writer, 'must show that a superfused fold of leather will occur at each corner; yet by working it towards a central point at the back or front, the currier succeeds in erasing or pressing out all irregularities, and in producing a surface sufficiently flat and regular, to enable him to operate. The paint-like edge of the leather is cut or trimmed to the beading which divides the upper from the lower panels. In many cases modern carriages have the roof only covered with leather, while the sides are black, nailed, and laced.

\textit{Japanned leather} of various kinds is used in coach-making, harness-making, and for various other purposes. Mr. \textit{A.} in his treatise on \textit{English Pleasure-Carriages} (p. 69), states that what is ordinarily termed 'patent leather' is covered with a coat of elastic Japan, which gives a surface like polished glass, impermeable to water; and that hides prepared in a more perfectly elastic mode of japanning, which will permit folding without cracking the surface, are called 'enamelled leather.' Such leather is usually made black, but may be produced of any required colours. 'All this japanned leather,' he observes, 'has the Japan annealed, something in the same manner as silver plate are laid between the skin and the skin to the heat of an oven at a particular temperature during several hours.' Boots and shoes are sometimes made of this enamelled leather, and they possess the advantage of never cracking. Black japanned leather is sufficient to remove any dirt which impairs their gloss.

Of the preparation of Morocco and some other kinds of leather which possess peculiar features in their manufacture, a notice may be of some interest. Mr. \textit{T.} in his \textit{P. C. C. C.} account of the manufacture of \textit{Russian leather}, called by the Russians themselves \textit{jucem}, which is usually dyed red with the aromatic saunders-wood, and is celebrated for being free from insects, notes how the skin is treated by the Russians against insects, but repelling them by its odour, so as to preserve books in the binding of which it is used. The skins are freed from the hair or fleece by steeping them in an aub-lye, then rinside, fullled, and fermented in a proper stream, after having been washed in hot water, for a week or more, to raise or open their pores. They are then cleaned, by working them upon the horse, on both sides. They are then soaked for about forty-eight hours, and then allowed to dry in the sun, finally being packed with a paste of rye-flour, in the proportion of 38 lbs. of flour to 200 skins, fermented with leaven. The skins, when taken out of the bath, are left in tubs for fifteen days, and then washed. Making the treat of the skin by astringent juice, they are immersed in a boiler containing a hot decoction (just sufficiently cooled to avoid injuring the animal fibres) of willow bark (that of \textit{Salix cinere} and \textit{Salix cauti-fera}), in which they are left for the action of the tanning juices, and then kept in an empyreumatic oil of the bark of the birch-tree, for the preparation of which Dr. \textit{U.}, whose account we have followed, gives full directions (\textit{Dict. of Arts.}, p. 719). This oil, to which the leather is indebted for its peculiarities, is applied only to the flesh side, and care must be taken to prevent its passing through and stain the grain side. Chevreul, having investigated the odouriferous matter of this oil, has given it the name of \textit{jucem}.
when he published his 'Engineer's and Mechanic's Encyclo-
dedia,' in 1839. This machine consists essentially of a stiff
circumferential frame or wheel, eight feet in diameter, revolving
horizontally upon a vertical axis, and carrying, on the under side
of its periphery, a series of circular polishers or grinders, whose
power may be obtained from any other source than the natural
force of the work to be performed. These, as the apparatus re-
volves, pass over a series of eight tables, circularly arranged,
and are thus so applied to the upper side of the skin that the
amount of pressure exerted upon the surface of each table can
be very accurately regulated. The tables are arranged so as to
be upon laid upon these tables, each of which is attended by
a man who lays the skin smoothly upon it, and moves it about
from time to time, so as to bring every part in succession under
the pressure of the polishing wire. The reflection, on the upper
side of the skin, of the light from the table, is so intense that
nothing could counteract the difficulties arising from the varying
substance of the skin, each table is further supported by a lever,
to one end of which is attached a trolley, on which the work-
man can place one or both feet. The effect of this arrange-
ment is that while both hands are left at liberty to manage the
skin, a greater or less pressure can be given at pleasure by
the operator, while, by entirely removing his foot from the trolley,
the tables may be caused to fall just clear of the rubber or polishers,
so that the skin will not be touched at all by them. That portion
of the surface of the table upon which the rubber operates is formed of brass, and adjusted to
a very perfect level by screws, and its edges are so slightly
bevelled off to prevent the rubber from striking the skin injuri-
ously as they come in contact with it. To obviate the com-
paratively trifling defect arising from the circular instead of
revolutionary mode of action, Mr. Devlin has contrived a ma-
tained similar machine, which is also described by Hebert,
in which the rubbers were attached to the periphery of a
vertical wheel about thirty inches in diameter, and the skin
was revolved, producing great reductions in the time and labor
of polishing the rubbers; but the serious practical objections to such a con-
tinuance are evident. Hebert did not know whether it had been
brought to work with advantage or not.

Leather-dressing machines, by which even very thin skins
may be divided into two thicknesses, each of which is capable
of being dressed as a perfect skin, have called forth much in-
genuity of contrivance. Descriptions of several such machines are given by Hebert, and of one, different to
any mentioned by him, in Dr. Ure's 'Supplement.' Before
such machines were introduced the reduction of thickness
necessary to bring many of the finer kinds of leather to the
requiring tension was effected solely, as it still is partially, by
paring or shaving the flesh side with a knife worked by hand,
an operation occupying much time, and requiring great nicety
to prevent cutting through the skin. The part shaved off,
also, being necessary in small pieces, was only available for
the making of gloves. By the use of a machine the best por-
tion of the leather, that with the grain side, is cut of a much
more even thickness and surface, with equal polish, as more precisely by hand; this removed portion is taken off in a more useful form; and the
whole operation is conducted more rapidly. Hebert states
that, to show the capabilities of a splitting-machine long used
by the manufacturer of 'Carrington' his machine can be used
for splitting sheep-skins into three equal parts, one of which, that
on the grain side, might be used as leather, the middle por-
tion converted into parchment, and the slice on the flesh side,
being unequal in thickness, and therefore unfit for any better
use, being used for glue-making. In this machine, which is
also represented and described in No. 563 of the 'Penny
Magazine,' the skin is drawn between two revolving rollers,
and presented, as it emerges from their grasp, to the edge of
a long and very sharp knife, which is kept continually moving
a little backwards and forwards with great velocity. As a
skin of unequal thickness could not be grasped in the proper
manner by the rubber rollers, the upper roller, instead of being solid, is composed of a number of
circular discs or rings of metal, about half an inch thick,
slipped on to an axis rather smaller than the holes in their
centre, so that the periphery of the rubber roller is composed. It
may be termed a planetary axis, which is a rod passing loosely
through holes in the whole series of discs between their centre
and their circumference, which is moved by the power of by its
ends, and turned upon itself in an opposite direction. By this contrivance the upper roller
is enabled to adapt its surface to that of the skin, which
is everywhere pressed with an equal force, due to the weight
of the discs of which the roller is composed. It is
stated in the 'Penny Magazine,' that this machine will split a
sheep-skin of the ordinary size in about two minutes, during
which time the knife makes from two to three thousand vibratory
motions to and fro. This machine, according to

Hemat, is the invention of Lieutenant Parr. In the machine
described by Dr. Ure, and in some others, the knife is sta-
tionary, and the cutting is occasioned by the application of a
steady force by which the skin is drawn against its cutting
edge; and in Duxbury's patent skin-splitting machine the
knife is fixed, the periphery of the wheel or disc is painted
on the rim of the wheel, and parallel to its axis. The skin to be
split passes round the circumference of a horizontal drum, the
axis of which is at right angles with that of the great
disc, and lies vertical to the plane of the table surface, and
which, instead of being perfectly cylindrical, has its sides
so hollowed as to present a concavity perfectly tallying with the
curvature of the periphery of the disc. As therefore the drum revolves, it brings the skin, which is confined closely
to its concave surface by a contrivance somewhat resembling
the upper roller in the machine above described, in contact
with the edge of the revolving knife, which cuts by a conti-
nuous onward movement, instead of a sawing action back-
wards and forwards. The extreme nicety required to fix
the concavity of the feeding-roller to the edge of the circular
knife, and to keep the knife or cutter itself perfectly true in
shape, appear to be the chief objections to this ingenious con-
tinuance.

We may close this article by referring to some practical
remarks on the choice or purchase of leather in the second
part of Mr. Devlin's 'Supplement.' The following is a
Knight's series of 'Guides to Trade,' premising that the sub-
ject of his complaint in reference to English leather is likely
to be, if it be not already, materially affected by the very
large and furious reductions which manufacturers under the tariff of 1842, and the still further reductions proposed in the governmental measure now (February, 1846) under discussion. After some remarks tend-
ing to prove a great deficiency of skill among shoemakers,
but even among tanners and curriers themselves, respecting the qualities of leather, Mr. Devlin
quotes from a pamphlet by himself for circulation among the London trade, on the 'Boot and Shoe Trade of
France, as it affects the interests of the British Manufacturer,'
the following remarks: — 'If we look, he says, 'to the nature
of our leather, to almost every description of our leather,
excepting that used for the soles, we shall find the article not
so good — so intrinsically good — as that which the French boot
and shoemaker can purchase; and what is more pertinent to
the matter is, that formerly it was not so, and that a more
honest consideration was paid by both tanner and currier to
the production of the highest degree of wholesomeness,
superiority of grain, a perfect blackness and uniform thinness,
and at the same time, without tampers and curriers, the
perfections. ' But what, he adds, 'cares the manufacturer?
He gets his work done rapidly, and, in consequence, cheaply;
and being, as he is, protected from the full effects of French
and other competition, he can give the prices we pay for, and
likewise, through this circumstance, feeling himself secure
of the commands of the home boot and shoemaker, he goes on in his capability, hurrying and driving through as much
business as he can, safe in his own interests, and never
perished, hurt, and insulted by those complaints which the
less fortunate and apparently more responsible shoemaker
is every day or hour under the compulsion of submitting to from
the consumer, about the leather breaking, tearing, or crack-
ing, or of its pressing on the foot with the severe hardness of
an uncomplying piece of wrought-iron.' After some remarks
indicative of his confidence in the ability of British manufac-
turers to excel in the financial and other matters of trade,
he disconcertingly do in some other kinds, he further observes that
were the same substance of leather to be wrought generally
into boots and shoes by the British manufacturer as is wrought
upon leather brought from foreign places, of which the
reflection would be still more glaring; and hence we are often
compelled into clumsiness, to make the coarse and unsightly
shoe which we may produce, the serviceable, and save the pocket
at the expense of the taste and the wish for more pliant and
pleasurable wear. ' Our roans too,' he proceeds, 'with
which we line our boots and shoes, can bear no comparison
with the roans of our neighbors; they are in many cases
hard and stiff and with the remains of the unextracted gelatine
matter of the skin, and are so secured on the grain with various
chalks and pigments to produce the requisite surface, that the
awl or needle in working is continually being thrust into

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many loose fibres, thus rendering the work not anything like so agreeable or so perfect as it ought to be. Add to which the quick manner in which such lining dries and roughness in a shop, and in the bar of the customer. In purchasing dressed leather, Mr. Devlin recommends the shoemaker to take care that it be not of too large growth for its substance, and that, if waxed calf, it have a "free easy grain," not roughish, not rubbish in, but, when bent inwardly a little, discovering a series of diminutive ridges or curls,—a pretty correct token that such leather has not been taken down too deeply." It should always," he says, "be shown in the feel, not rank with grease, but yielding and smooth from the manner it has been wrought." Skins freshly curried should not be bought for immediate use, "all calf or other oil-dressed leather being the better to be laid by for a month or two before they are put on; leather in this condition, as the phrase is, "fattening," and thereby attaining a more durable character." "The qualities of sole leather," which is generally better in England than in any other country, are, according to the same writer, "defined by its closeness, weight, and, when cut, by the uniform healthiness of hue it offers to the sight; badly tanned hides being generally streaky, black, brown, grey, and green." Hebert describes two compositions which have been patented as "substitutes for leather." Of these, Gunby's, patented in 1824, consists of an elastic coating or varnish of glue-size, boiled linseed oil, lampblack, white lead, and pipeclay, varying in different cases according to the number of times the composition is acquired, spread upon cotton, linen, or woollen cloth, or upon felt; while Hancock's consists of a felted fabric of flax, cotton, or other material, covered with several coats of liquid composition. This substitute is chiefly intended for the manufacture of patent tins, but is suitable also for covering coach-tops, and for some other purposes.

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LEDMUM, a genus of plants belonging to the natural order Ericaceae. It has a minute 4-toothed calyx, 5 spreading petals, from 10 to 10 stamens, anthers opening by two pores at the base. The flowers are somewhat similar in appearance, sessile, 5-lobed, stalked, and dehiscent at the base. The seeds are furnished with a membranous wing at each extremity.

L. latifolium is a small evergreen shrub, with an irregularly branched stem. The branches and under surface of the leaves are woolly; the calyx is very minute; the corolla white, with obvolute oblate petals. It has been commended as a staminage; but an infusion of the leaves in beer renders it unusually hearty, and produces headache, nausea, and even delirium. Pallas however says that they have been used with advantage in tertian aques, dysernities, and diarrhoea. The peculiar bitter flavor of this species is a native of the swamps around Hudson's Bay, Labrador, Greenland, and various parts of the United States. L. pustulare has linear leaves, with revolute margins, clothed with wool, and in this state it has a stem longer than the corolla. It is a native of North America, in the swamps of Canada and New York, also the North of Europe, Denmark, Silesia, &c. L. pustulare has somewhat similar properties to those attached to the former species. In Germany, a kind of beer is made from its leaves, and it has also been recommended as a febrifuge. This species was formerly admitted into the catalogue of British plants; but Mr. Babbage considers that it has no claim to appear there, and has omitted it accordingly.

L. Canadense has ovate petioloate leaves, white beneath; the flowers disposed in terminal large umbellate corymbles of a white or yellowish color. It is native of the swamps of Canada, soil or a very sandy loam answers best for the cultivation of the species of Ledum, and they are readily propagated by layers or by seeds. The seeds should be sown, and the seedlings forwards managed in the same manner as the Rhodo-dendron.

(Don, Gardener's Dictionary; Burnett, Outlines; Babington, Manual of British Botany.)

L. foliaceum, P. C. S.

LEFEVRE, FRANÇOIS JOSEPH, Duke of Danzig, and Marshal of France, was born of humble parents, at Raisbach, in Upper Alsace, on the 25th October, 1755. He was at first unwilling to receive his lord's son, and when his father, he enlisted, when eighteen years of age, as a private soldier in the regiment of French guards. He had attained the rank of sergeant-major when, on the breaking out of the French revolution, that regiment was dissolved. The changes which then took place in the government of France removed those obstacles which prevented the promotion of meritorious soldiers who were deprived of the advantages of fortune; and Lefèvre, having displayed sagacity and talent and services deserved, and in 1792 he became a captain of his regiment. In that capacity he was enabled to render some valuable assistance to the unfortunate family of the deposed monarch, counteracted by the court of Versailles, when interposed in their behalf, and, at the peril of his life, rescued them from an infuriated populace. His subsequent rise in the army was without precedent rapid, even at that period: on the 5th of November, 1792, he was made a colonel of dragoons, on the 2nd of December, in the same year, he was a general of brigade; and on the 10th of January, 1794, he rose to the rank of a general of division. While serving with the army of the Moselle, he distinguished himself at the combat of Lambach, and in the battle of Giebsberg. During the whole of the campaign in Germany and the Netherlands, under Fichergau, Moreau, Hoech, and Jourdan, he made himself conspicuous for his skill and courage. In 1796, when the French army under General Kléber had passed the Rhine [Kléber, P. C. S.], the Austrians, finding themselves compelled to retire from Uckerath, had entrenched themselves, twenty thousand strong, on the heights which surround the small town of Altenkirchen. Their formidable position was attacked on the 4th of June by Kléber, who formed his army into two divisions, the first of which, the advanced-guard, be it remembered, was commanded by Lefèvre de Furstenberg, and fell on that division, which boldly charged the enemy at the point of the bayonet, and, in spite of a most vigorous resistance, compelled them to retire in disorder, leaving behind them a large number of their killed and wounded. Thus were thirty thousand prisoners. On the 25th of March, 1799, was fought the memorable battle of Stockach, in which Lefèvre acquired fresh renown; with only eight thousand men he resisted, for many hours the attack of thirty thousand Austrians. For these eminent services however Lefèvre appears to have been but poorly rewarded, and there is extant a letter from him to the Directory at Paris, in which are contained the following passages. "I am thus characterised the poverty of France at that period,—"The definitive conclusion of peace," he says in it, "will enable the country to dispose with my services. I petition you therefore to assign me a pension which may maintain me in comfort. I ask not for carriage or horses, but only for bread. My services must be well known to you, and I shall not enumerate my victories; as for defeat, I have none to reckon." At the time when Bonaparte was placing himself at the head of affairs, the Directory, who supposed Lefèvre devoted to their cause, appointed him to the command of the guards of the army of the Rhine; but, on the morning of the 18th Brumaire (October 14th), he attended the meeting of the convention at Bonaparte's private residence, and cordially co-operated in their proceedings. He was also instrumental in extricating Lucien from a disagreeable position in the stormy meeting of the Council of Five Hundred, E. St. Clair, Bonaparte, P. C.; Bonaparte, Lucien, P. C. S. These important services were rewarded by the command of the seventeenth military division, whose head-quarters were at Paris.

In the year 1804 he was raised to the dignity of a Marshal of the Empire. He accompanied Napoleon the following year in the Austrian campaign, and in 1806 took an active part at the battle of Jena, where, though at that time upwards of fifty years of age, he fought on foot at the head of the guards.

In 1808 he was sent with an army of sixteen thousand men to invest Danzig, which was garrisoned by twenty thousand troops, besides a numerous militia, and the investment was completed on the 14th of March. A body of twelve thousand Russians, who came escorting to the relief of the Austrians, and Lefèvre was compelled to divide his force, and to detach a portion of them to oppose the Russians. On the 15th of May a severe action took place between them and the French, when the Russians were seconded by the troops of Murat, and General Oudinot, who had been sent by the Emperor to their assistance, successfully repelled nine Russian regiments, and a part of the Prussian garrison by whom they had been joined. The Marshal, however, in the midst of battle, and having designed to make, as far as the command and General Kalk- reuth offered to accept terms of capitulation; the long resistance which this fortress, among the strongest in Europe, was still able to make, rendered these terms as favourable as could
be expected. The garrison were allowed to retire with the honours of war, and to take with them their munition and baggage, on the condition of giving their parole not to serve during the space of one year against the French or their allies. The emperor, who was then occupying Buda, determined to despatch the two generals, who lent him so powerful an assistance, to join him in the honour of signing the capitulation, but with a similar generosity, they declined to share with him a triumph which belonged to the soldier. On the 17th of July, 1814, Lefebvre and Mathis accordingly devoted these events, Napoleon, who was desirous of reviving the high nobility in France, and to give additional lustre and more munificent rewards to the twenty-four grand dignitaries who were still in existence, was wont to confer on them the title of Prince. This marshal being highly esteemed by the army, and his eminent services during the wars of the Revolution having acquired for him the gratitude and respect of every Frenchman, he was chosen as the first person on whom to confer the ducal dignity. The siege of Danzig indeed was one of the most brilliant triumphs of the Prussian campaign. Eight hundred pieces of ordnance and immense magazines fell into the hands of the conquerors, and the capture of this important fortress not only secured the left flank and rear of Napoleon’s army, but left to Prussia only the stronghold of Pillau along the whole coast of the Baltic. (Lamartine, P. C.)

In the year 1808 Lefebvre joined the Peninsular expedition, and was appointed to the command of the fifth corps of the French army. On leaving, the Emperor had given him orders, and the latter was to be left behind, but when employed in the province of Biscay, finding that the enemy were seriously harrying the flanks of his army, he gave them battle, and on the 1st of November triumphantly executed his commission. It is said that on this occasion appears to have given displeasure to Napoleon, as it interfered with his plan of operations. He was afterwards present at the battle of Toulouse, where he had the command of the cavalry. (Lamartine, P. C.)

In the German campaign of 1809 he rendered himself conspicuous as a brave soldier and an excellent tactician, at the battle of Eckmühl and Wagram, and in the dangerous warfare among the peasants in the Tyrol. [It was also with Napoleon in the disastrous expedition to Russia, and had the command of the old guard, which was however seldom called into action; but during the retreat he showed considerable military skill, and, for the most part, accompanied his corps on foot, sharing every suffering and exposing himself to every danger in common with the privates.

During the campaigns of 1813 and 1814 he appears faithfully to have adhered to the declining fortunes of his master; and after the battle of Leipzig, when the remnants of the French army were called to fight for the defence of their native country, by none of his lieutenants was Napoleon more ardently cheered on than by Lefebvre. (February 10, 1814), at Arcis-aux-Aube (March 20), and at Mont-Miara (April 14), he displayed the same gallantry as in the more renowned but no more glorious fields of Wagram and Eckmühl. It is said that he was so much impressed that it was decided to remove Lefebvre greatly influenced the abdication of Napoleon, and at the first restoration of Louis XVIII. he was created Chevalier of St. Louis and peer of France. But on the return of his former chief from Elba, we find him again adhering to his fortunes, and accepting a seat in his Chamber of Peers, where however he held himself aloof from all discussions. (Journal des Débats of the 10th April, 1814.) At the second restoration of the Bourbons, he was excluded from the Chamber of Peers, to which he was recalled in 1819, having been a few years previously reinstated in his rank of marshal. He died at Paris on the 14th of September, 1836, and his body was interred in the Panthéon. But distinguished generals are perhaps more to be admired than his public character; it being difficult to reconcile his conduct, during the latter years of his life, with genuine patriotism. His manners evinced the modest simplicity of a soldier who had risen by merit alone; his indolence, which was proverbial, was rendered manifest by his leaving a widow so destitute, that she was obliged to sell her jewels in order to defray the expenses of her children; but his attachment to the memory of his wife, and the devotion with which he guarded the memory of her husband in the cemetery of Père-la-Chaise.

The character of this excellent woman, who was of the most humble origin, may be best judged from the following inscription on her monument in the cemetery of St. Helen's: (vol. iii. 389).

"There was another well known general of Napoleon, the Count Charles Lefebvre Demoussonet, whose name has some times been confounded with that of Marshal Lefebvre. He was condemned to death on the second restoration of the Bourbons, but he was enabled to take refuge in the United States. He perished in a shipwreck on the coast of Ireland, as he was returning to Europe, on the 22d of April, 1822. (Biographies de Napoléon, by M. de Charette. Biographie Moderne; Dict. Hist. des Batailles; Tissot, Précis des Guerres de la Révolution, Paris, 1821; Mémoires de la Duchesse d’Abrantes, Las Cases, Mémorial de St. Hélène; Court and Cabinet Memoirs of Napoleon, vol. ii, pp. 129-130.)

Lefort, FRANÇOIS, was the son of Jacques Lefort, member of the Grand Council of Geneva, in which city he was born in 1656. After having served as a cadet in the Swiss Guards in the service of the Emperor, in 1674, he followed the regiment belonging to the Duke of Courland, in the pay of the Dutch, he was induced to try his fortune as a military man in Russia, and obtained a captain’s commission from the Czar Feodor or Theodore Alexievich, and greatly distinguished himself in the wars with the Turks and the Tartars. Having in 1678 married Mademoiselle Souhai, whose father, a native of France, held the rank of lieutenant-colonel in the Russian service, he returned his native country in 1682, but, staying only for a few weeks, got back to Russia in time to be in readiness for the crisis which occurred on the death of Theodore (P. C., xviii. 20). His abilities being well known, he was appointed to be the Prince Galitzin, who governed the country under the Princess Sophia, in the name of her two brothers Ivan and Peter, one of the captains-general, a post of great importance, and was ordered to intercede on behalf of the Tsaritsa, or old national militia. In this capacity he first attracted the attention of the young czar Peter, in the early part of the year 1683; and on the 29th of June in that year he was made a count of the rank of major. When, in 1689, Peter took refuge in the Troitisk convent, Lefort was one of those who joined him there, and on the overthrow of the usurpation of Sophia, which followed, he became the chief minister of the emancipated emperor. Many of Peter’s greatest plans are believed to have been suggested by Lefort; all the Czar’s measures for civilizing and elevating his country found in him, at least, the most able and assiduous support. Holding at once the rank of general and that of admiral, Lefort was always equally ready for service by land or by sea; and his active and versatile faculties alone as much in civil affairs as in military. At last Peter lost this inestimable servant by his death at Moscow on the 12th of March, 1699: his health had been for some time declining, and a fever following upon the breaking out of an old wound carried him off. Peter lamented as he if he had been a brother. Lefort’s moral influence has been as admirable as was his capacity; considerations of self-interest were always postponed by him to the public good and to the glory of his sovereign, and a noble contempt of everything that could degrade or injure the whole character of the son, but he died at an early age. There is a Life of Lefort, in French, by Bassville; and there is a long article about him in the ‘Biographie Universelle,’ by Callot Calle- ville, who refers to him in his book. First, and second, the above outline has been abstracted. See also Valtorta’s ‘Life of Peter.’

LEGACY DUTIES. (Hargrave Duties, P. C. S.)

LEGION OF HONOUR, an order of merit in France, instituted by Napoleon during the year 1802, as a recompense for military and civil services. This order consists of five divisions: chevaliers, of whom the number is unlimited, officers, commanders, grand officers, and grand crosses. The members swear fidelity to the king, to the charter, and to the laws. The ordinary regulations require twenty-five years’ service during peace, and half that period during war, in a civil or military capacity. This is considered indispensable to the time of war, a brilliant exploit, or a severe wound, are deemed sufficient to qualify for admission into this order. This honour is frequently granted to any distinguished person who, by the pleasure of the king, is raised to a superior rank, is considered indispensable for natives of the country to have passed through the inferior grades. To obtain the rank of officer it is necessary to have served four years as a chevalier; and must serve two years to become commander; a commander three years to become a grand officer; and, finally, to obtain the highest grade, which is that of grand cross, he must have served five years as a chevalier. When a promotion takes place the king determines the number of decorations of each grade, and a distribution is made by the chancellor of the order in the following proportion, 40 to 40:--
2 to the minister of Justice and Religion.
1 Foreign Affairs.
5 Home Affairs.
2 Public Works.
20 Finance.
5 War.
1 Marine.
1 Public Instruction.
6 Grand Chancelier.
40
On all public occasions certain military honors are due to persons decorated with this order, and, at all times, a soldier on active service assumes on such occasions the decorations.

The following salaries are attached to the different grades: chevalier, 250 francs; officer, 1000; commander, 2000; grand officer and grand cross, 5000.

In the formation of this order, as at first designed by Napoleon, though of a strictly military nature, the honor was not restricted to military men alone, but was intended to be the reward of civil, scientific, and literary services. He wished, moreover, that the name which he gave it should imply its object, which was to form a body of the most distinguished citizens, specially bound together by the ties of honor and devotion to their country. The legion, which was to be composed of twenty members, was to be selected by a supreme council, composed of seven members, the three consuls, and four grand officers—the first of whom was to be chosen by the senate, the second by the legislative body, the third by the council of state, and the fourth by the council of state. He likewise enacted that all military men, who had previously received honourable distinctions for their services by the republican government, should be, of right, members of the order.

The proposition of the first consul, when presented to the legislative body and to the tribunate, met with a violent though not unexpected opposition. The representatives of the French nation could see in it nothing but a powerful weapon of military despotism, to be sooner or later wielded by one whose projects of absolute rule were beginning to be discovered. His brother Lucien, moreover, to whom the motion had been entrusted, by his imprudent zeal in urging its adoption, raised in the minds of many the idea that he was enforcing the interests of his family rather than those of the nation. Even in the council of state, which, by the nature of its constitution, was especially under the influence of Napoleon, it was deemed by some to be a most dangerous experiment, calculated to reanimate aristocratical feelings, and gradually to introduce the ancient régime; while others, among whom was the general Mathieu, who, though a good soldier, was distrustful that the institution should be restricted to military men.

Among the representatives of the people, the general expediency of the institution itself was still more strongly combated than it had been in the council of state. ‘Mathieu, ’ Cross says, ‘are the pillars of an hereditary throne; they were unknown to the Romans when they conquered the world.’ The first consul’s reply to these different menaces was many observations strikingly pertinent and correct. ‘Such ideas,’ he remarked, ‘ might be well adapted to the feudal ages, when the knights were accustomed to combat together, man to man, and the bulk of the nation was reduced to a state of slavery. But when the military system changed, it was then not prowess in war, but science and skill, which decided the fate of nations. In all civilized states military force must of necessity yield precedence to civil qualities. Bayonets must lower before the priest who speaks in the name of heaven, or the man of science who has obtained an influence by the ascendancy of his knowledge. Think not that it is as a general that I govern France; but because the entire nation believes no possessed of that ability in the direction of civil affairs so necessary to a ruler; without it I could not, for an instant, keep my ground.’—‘France, he continued, ‘contains thirty millions of men, united together by the ties of intelligence, property, and commerce; what are four hundred thousand soldiers in comparison to such a mass? and moreover, not only does a commander preserve his influence and ascendancy over the soldiers of his army chiefly in virtue of his qualities as a civilian, but, when his command ceases, he returns to the rank and position of a private individual. The natural tendency of military men is to carry every thing by force; the enlightened and educated civilian, on the other hand, elevates his views to the perception of the general good, and follows an opposite course of conduct. I have no hesitation in assuring you that, if a preference is to be awarded to the one rather than to the other, the French society was divided between the two orders, soldiers and citizens, you create disunion into what should be but one body.’

Influenced by these arguments, a majority of the council agreed to the proposed honors should be extended indiscriminately to civil and military men of distinction. At length, after many an angry discussion, the project was passed into a law on the 29th Floréal (May 19th, 1802), in the national assemblies; in each of them, however, by a small majority.

The Legion of Honour, though it undoubtedly seemed a forerunner to that new nobility which Napoleon, in after years, even attempted to mould into an institution in the highest degree important to his interests, and popular among the nation. On the 24th of July, 1804, Napoleon distributed to the principal civil and military dignitaries of France the higher order of decorations. The splendid church of the Hotel des Invalides was the place appropriately selected for the distribution. He had not as yet given the decorations of this order to foreign courts; as a prelude to doing so, he bestowed it upon the venerable Cardinal Caprera, who, in his capacity of legate, represented Pope Pius VII. at Paris, and, to enhance the value of the honour, on that occasion, detached from his own neck the ribbon of the order. He also created, about the year 1810, an aged representative of a church with which France, through his instrumentalities, had been happily reconciled. (Thiers, Hist. du Consulat, &c. b. x.)[121] [BONAPARTEE. P. C. A.]

But a short time before he ascended the throne, he placed in the line of march of the first consuls and many of the grand officers, in the large number of persons who were drawn up on the slopes of the great and famous hill, on the high stage of the great and famous amphitheatre, on the western side of the hill, on which is situated the so-called tower of Cassar. An elevated throne was raised in the centre of this theatre, and the soldiers were drawn up in front of it and on the hill below it, as if the whole of the place were the throne as their centre; beyond them was congregated a countless number of spectators. At mid-day the emperor ascended the throne, amidst the din of military salutes and the acclamations of the crowd; near him was placed the famed buckler of Francis the First, while the decorations of the order about to be distributed were contained in the helmet of the illustrious Chevalier Bayard. He was surrounded by his brothers, by the chief functionaries of the empire, by the marshals and generals of his army. Amidst this proud array were to be seen the ancient standards of the republic, the witnesses of the victories of Rivoli, Arcole, and Marengo. Napoleon, in presence of all these, and in the presence of the general Mathieu, who, then raising his voice, and addressing the veterans of his army, exclaimed, ‘Ye Crossed swords! ye men who have shared the hazard of your lives, the honour of the French name, your country, and your emperor.’ This animating appeal was responded to by the deafening shouts of the mighty multitude. The stands were filled in an instant, the place was cleared, and this imposing ceremony was concluded by a general review of the whole army, whose ranks drilled before the imperial throne. Napoleon estimated at twenty-five thousand the decorations he had distributed during the ten years of his reign. This remarkable institution has outlived the fortune of its founder. Its benefits were appreciated by the Bourbons, who, soon discovered that it was the most powerful means they could employ of increasing their popularity, and giving stability to their precarious position. It has been wisely adopted, and its utility has been increased, under the pacific reign of the house of Orleans. By its means the present king of the French has been enabled, at a comparatively small expense to the state, to consolidate the empire and to reward the merit of the most deserving citizens. It has been placed on the breast of an Arago, a Guizot, and a Thiers, with equal honour, and as much applause, as it had been on those of a Ney, a Massena, and a Lannes. It is to the credit of the French nation that, while no other people are perhaps so much under the influence of military renown, it could bestow this title upon those whose only claim to it was where men of science and literature are more generally esteemed and rewarded.

But the benefits which have accrued to the French from this institution may be best described in the eloquent
words of one of their living historians, in his history of the constable and the empire. 'The institution of this order,' he says, 'dates scarcely more than forty years' existence, and it is now consecrated in the memory of the people, as if it had passed through the lapse of many ages; so much has it become a custom for the years, a kind of solemnity, a sort of talent and merit of every kind; so much has it been sought after by the great and principal personages of Europe, those even who pride themselves the most on the honours of their ancestry. Thus that when he came out of the household, the head has declared in favour of its worth and utility. Leaving aside the abuse which has occasionally occurred in the distribution of its distinctions, under the various governments which have succeeded one another, an abuse inherent in all rewards bestowed by man upon his fellow men, let us gratefully recognize what there was novel in plan, profound in design, and beautiful in execution in an institution whose object it was to place on the breast of the common soldier, or on that of the unsung man of science, the same decoration which was destined to confer distinction on the commander-in-chief of armies, on princes, and on kings; let us recognize Office the creation of these honorific rewards, the most brilliant triumph of true equality, that equality which raises instead of abusing the minds of men; let us recognize, in short, that if to the great in civil or military life it might become a source of gratification, if it to the common soldier, returned to his domestic hearth, at once the pledge of honourable ease and a visible proof of his former prowess.'

(Thiers, Histoire du Consulat et de l'Empire, vol. iii.)

The author of this passage is yet to be identified, but it is clear that he has taken place in the members of this order, and also how liberally its honours have been distributed by the present king of the French. We are indebted for the latter part of these remarks to the late Mr. J. Conder, the London correspondent of a highly esteemed periodical. The following is an extract of the list of the officers of the Legion of Honour who were appointed in the year 1814, and who have received the order:

<table>
<thead>
<tr>
<th>Grand Croix</th>
<th>99</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commandes</td>
<td>195</td>
</tr>
<tr>
<td>Chevaliers</td>
<td>37</td>
</tr>
</tbody>
</table>

Total: 42,892

Thus it appears that there has been an increase during the reign of nearly 48,000 members; the diminution in the highest decorations has probably arisen from the deaths of many of the old and distinguished who died in the year 1844, 29,843 received no pension, and 19,851 drew the salaries attached to the order. The revenue during that year was 7,000,000 francs, about £280,000, and the expenditure 6,897,728 francs, about £275,500. Our information respecting that year is derived from the French newspaper 'le Courrier de l'Europe' published in London.

A full account of this order and of its most distinguished members may be found in a work entitled 'Fastes de la Légion d'Honneur,' 4 vols. Paris, 1842 and 1844.

LEGITIMATION. (Bairstow, P. C.)

LEGUMINOSITAS, a genus of fossil fruits, from the Isle of Sheppey. (Bowerbank.)

LEICESTER, OF HOLKHAM, THOMAS WILLIAM COKE, EARL OF. Thomas Coke, Esq., of Holkham, Norfolk, grandson of Sir Edward Coke, the chief-justice, was in 1728 created Baron Lovel, of Minster Lovel, in Oxfordshire; and in 1744 Viscount Coke of Holkham, and Earl of Leicester. On his death without heirs his estate devolved on his sister Anne and her husband, Colonel Philip Roberts, who thereupon assumed the surname and arms of Coke. The subject of the present notice was his son, by his wife Elizabeth, daughter of George Edwards Denton, Esq., and was born on the 4th of May, 1752.

His father, who had been returned to parliament as member for the county of Norfolk at the general election in 1774, having previously been for Harwich, was, in 1775, returned for the town of Derby, died in 1776; upon which his son succeeded in the representation of the county. In a speech which he made at a dinner given to him in 1838, he stated that he had been slow to come forward on this occasion, with great reluctance, being no orator or politician, having just returned from abroad, and being attached to other pursuits. They told him however that if he would not stand, a Tory would be sure to; and upon this he was all chilled over from head to foot, and he resisted no longer. This horror of Toryism, or of what he imagined that term to mean, constituted nearly the whole of Mr. Coke's political system to the end of his life. He was returned again for Norfolk at the next general election in 1780; but after the dissolution in March, 1784, he was one of the numerous supporters of the late unpopular Coalition Ministry, who were thrown out, and who received the name of Fox's Martys. He recovered his seat however in 1790; and he was also reelected without a contest in 1796 and in 1802. At the next general election, in 1806, he was returned by a majority of 411 to 3772 for Mr. Williamhowe, but was unseated by a Committee of the House; upon which he was elected for the town of Derby, and his younger brother, Mr. Edward Coke, who had vacated his seat for that borough, took his place at the election for Norfolk in 1807. At the next election, in 1807, Mr. Coke became again member for that county, which he continued to represent down to his retirement from the House of Commons in 1833.

Mr. Coke, though a keen and steady partizan, was not a frequent speaker in parliament. The two occasions on which he appeared most conspicuously were, on the 24th of March, 1783, when in a short speech he moved an address requesting that his majesty should be pleased to form an administration entitled to the confidence of the people, which, being assented to, was followed by the resignation of Lord Shelburne and the formation of the Coalition Ministry of Mr. Fox and Lord North; and on the 2nd and 3rd of February, 1824, when he carried two motions against the existing ministry of Mr. Pitt, which however had no effect. He also on subsequent years came forward on some occasions when measures affecting agriculture occupied the attention of the House. In all matters of general policy he voted with Mr. Fox, and after his death with Lord Grey and what was commonly called the Whig party.

His influence in the country arose from his large estates and the lead he took in agricultural improvement, together with his popular qualities as a landlord and a country gentleman. He is said to have raised the value of the estate of Holkham, in the period of between sixty and seventy years during which it was in his possession, from little more than 2000l. to above 20,000l. From the death of Francis, duke of Beaufort, when he succeeded to the estate of Holkham, it passed to the 2nd Earl of Leicester, of which estate he inherited, but which had in the mean time been bestowed, in 1784, upon Lord Ferrers, afterwards Marquis of Townshend, to whom it passed. It is said that he thought a very strong measure, when, to gratify the old man, the same title, with the slight and not very intelligible variation, 'Leicester of Holkham,' was bestowed upon a second person. It is also said that the same title, with the addition of which Mr. Coke had subsequently acquired a higher title; he was still notwithstanding as much Earl of Leicester as Marquis of Townshend. The proceeding was precisely of the same
nature as if Mr. Coke had been made Duke of Wellington, of Holkham.

The Earl of Leicester died at Longford Hall, Derbyshire, on the 30th of June, 1832, at the venerable age of ninety. He was twice married: first, in 1775, to Charlotte, daughter of James Surman, Esq., who died in 1800, and by whom he had three daughters, and many grand-children and great-grandchildren; secondly, on the 26th of February, 1822, to the Lady Anna Amelia Keppel, eldest daughter of the Earl of Albemarle, who was then not quite ninety, and who brought him three sons and a daughter. The eldest son, born on Christmas-day, 1822, is now Earl of Leicester.

MEMOIRS OF THE LIFE AND TIMES OF THE EARL OF LEICESTER, written by Edward Vestey, &c., published in 1842. See also in the number for December, 1842, a short notice of his will, in which he is said to state in that document that he had lately expended the sum of 500,000l. in the improvement of his estate.

LEI'odon, a genus of fossil reptiles. (Owen.) One species found in the chalk of Norfolk.

LEIPA (generally called Böhmisch-Leipa), is a town in the circle of Leitmeritz, in the kingdom of Bohemia, and in the lordship of Neuensch, belonging to Prince Kunnit. It is situated on the river Polza, and has about 6000 inhabitants, who have flourishing manufactories of woolen-clth, cottons, calicoes, and very beautiful earthenware and glass-works. There are a gymnasium and a high school in the town.

(Hörschelmann, Handbuch; Stein, Leizon; Cambriaich, Lehrbuch.)

LEJRE, a genus of plants belonging to the natural order Aroidee, and the suborder Lennaeoc. It has a 2-sowered membranaceous oculate spathe; the male flowers consist of two stamens; the fruit is reticulate and indesiccous. The flowers are almost diminution of stems and leaves. The flowers appear just below the margin of the frond. Several species have been described. 'They are all inhabitants of stagnant waters, and are known familiarly by the name of 'Duck-weeds.'

(From the Bay of British Birds.)

LEMOINE, FRANÇOIS, a celebrated French painter of the eighteenth century, was born at Paris in 1788. He was the pupil of Louis Galleuche, early distinguished himself, and in 1772 he was elected a member of the Académie de Peinture: his presentation-piece was an excellent picture of Hercules killing Cacus. He obtained a great reputation by his painting, in oil, of the Transfiguration of Christ on the ceiling of the church of the Jesuits, Rue du Bac. In 1794 Lemoine visited Italy, where he remained for a year; the artists whose works chiefly attracted his attention were Pietro da Cortona, Lanfranco, and Bernini. After his return to France he was made professor of painting in the Académie, and in a few years his reputation surpassed that of all his Parisian contemporaries: Louis XVI. appointed him in 1796 his principal painter, with a salary of 40,000 francs, in the place of Greuze, who had just died. The first and most celebrated of Lemoine's great works was the cupola of the chapel of the Virgin in St. Sulpice, in fresco, which he commenced in 1792, and which formed the King's ladies' bower. His second is the Apotheosis of Hercules, painted in oil on canvas pasted on the ceiling of the Salon d'Hercule at Versailles, commenced in 1792 and finished in 1796. It is a grand composition, containing one hundred and forty-two figures, and it is the most extensive and most magnificent monument of painting in France, though in a florid and superficial style, and, like the works of his model, Pietro da Cortona, belongs to the class of works called piturescse by the Italians. The composition is arranged in nine groups, is vigorous and effective in arrangement, colour, and light, and especially in aerial perspective; but it is a purely decorative work, and is effective only as a pattern; it has little individual merit, and the drawing wants correctness, expression, and distinctive character. Lemoine used on the ground of this picture, the blue vault of heaven, ultramarine to the value of 10,000 francs; it was finished in the fifty-four.

After the completion of this great work he was without a rival in France, but he never enjoyed his success. He was naturally of a melancholy temperament, a weakness which the charge imposed on the artist, the constant apprehension arising from an insatiable ambition, combined with vexation on account of the depression of his less successful contemporaries, aggravated to that degree that it amounted to a chronic aberration. In 1778 he destroyed by an accident his nervous fits, June 4, 1737, ten months after the termination of his great work at Versailles, and in the fiftieth year of his age.

Lemoine painted also many excel-lent pictures, both of large and of very small dimensions, and the latter have realized high prices at auctions: a Flight into Egypt is considered his best easel-piece. There is not a single picture by him in the Louvre at Paris. Many of his works have been engraved by Done, Lemaitre, J. N. whilst others by H. S. Thomas, Silvestre, Larisseau, Costard, &c.; Louchet, Natoire, and Noisette, distinguished painters, were the pupils of Lemoine.

(D'Alembert et Diderot, Dictionnaire des Arts, &c. ; Gault de Saint-Germain, Trois Siecles de la Peinture en France.)

LENSCISCUS, L. ENGLISH, a native of Ascot in Berkshire, a district of the ancient province of Orléans in France, on the 13th of April, 1661, and was the son of Paul Lensant, the Protestant minister of Châlille-sur-Seine. Being destined to the same profession as his father, he was sent to prosecute his studies at Saumur; during his residence at that university he lived with the learned Jacques Cassel, the professor of Hebrew, with whom he formed a friendship which continued during their lives. He afterwards completed his theological education at Geneva and Heidelberg, in which latter town he was admitted into the ministry of the Protestant church in December, 1678; during the month of April he was ordained. In 1687 he obtained the appointment of minister of the French church at Heidelberg, and chaplain to the Dowager Electress Palatine. The invasion of the Palatinate by the French troops, under Marshal Turenne, in 1692 drove him to leave Heidelberg in 1688, and he settled at Berlin. The fear of meeting his countrymen arose from having rendered himself obnoxious to the Jesuits by two letters which he had written against them, entitled 'A Preservation against a re-union with the Church of Rome.' Though the Protestant French church of that city had already a sufficient number of pastors attached to it, the accession of Elector Brandenburg, who was at that time King of Prussia, who knew Lensant by reputation, appointed him to that church, where for upwards of thirty-nine years he performed duty. In the year 1706 he married Mademoiselle de Courgues, daughter of a French Protestant minister from Poitou. In 1707 he visited England, and it is recorded that he was admitted to preach before Queen Anne, though we do not understand how he could have been permitted to do so without having received episcopal ordination; it is further stated that the Queen wished him to enter the Church of England, and offered him, in case he resolved to do so, to appoint him her chaplain. In 1710 he obtained the situation of chaplain to the King of Prussia, and consented to the high consistory. He was also a corresponding member of the Society for the Propagation of the Gospel in Foreign Parts, which had a few years before been established in London. Lensant was succeeded in his situation by his first associate. His death was the more regretted, as it came amidst enjoyment of perfect health, on the 29th of July, 1728, and he died on the 7th of August following.

His character was a short-piece however was not ennobled, and his manner simple and modest. Of a reflective turn of mind, he spoke but little, and that little well. Though a most voluminous writer, he was fond of society, and opened himself with out reserve to the confidence of his friends. He is said to have had few personal enemies, which may be readily believed, for his character is universally described as remarkable for its disinterested charactery, and for the exercise of the peaceful virtues of a Christian. As a preacher, his manner was pleasing and persuasive; the manner of his discourse was chiefly of a practical nature, and his eloquence was rather chaste than energetic. His varied talents and the depth of his learning have made him a source of instruction to numberless and valuable works which he has left, many of which are of indispensable utility to the theological student. The style of his writing is elegant, though never florid; it has no less force than that of Juvénal [Juvenal], and in eloquence than that of Saurin [Sarin, P. C.], but the French is more pure, and the diction more chaste. In one respect especially he is far superior to any of the French Protestants; he is nearer to those of the latter years of his life, contain little asperity and few severe expressions of condemnation against those who differed with him in opinion. It is not certain whether he died during the period of the 'Guerre de l'Allemagne,' which was commenced in 1720, but it is well known he took a prominent part in its execution, and he is the acknowledged author of the preface.
LEO

LEP

Lenfant's first work, which appeared in 1688, was a review of one of Bruyès, who, though a celebrated French dramatist, has written several theatrical works in defence of the Roman Catholic faith. In 1688 he published a translation of a selection from the letters of St. Cyprian, in 1690, a defence of the Holy Embassy to Pavia, annexed to his "Preservative," etc., a work we have before alluded to; and in 1691, a Latin translation of the celebrated work of the artists and architects of the French Revolution, "After Truth." His history of the female of the Pope Joan, appeared in 1694; the arguments in it are drawn from the Latin dissertation on that subject of Spanheim. It is said, however, that, in after life, Lenfant and his wife provided for the support of their family and the publication of a work of fiction. [Joan, Pope, P. C.] In 1708 he appeared his remarks on the Greek edition of the New Testament, by Mill, which are in the "Bibliothèque Choisis" de Le Clerc, vol. xvi. The following works afterwards appeared in succession: 1, Réflexions et Remarques sur la Décision du Parlement à la matière d'un Juif; 2, Souvenirs Historiques touchant la Communion sur les deux espèces; 3, Critique des Remarques du Père Vauban; sur les Réflexions de Rapin touchant la Poésie; 4, "Réponse de Mons. Lenfant à Mons. Dartin au sujet du Socinianisme." The above short works are to be found in the "Nouvelle de la République des Lettres," a review to which Lenfant was a frequent contributor.

In 1714 was published his learned and interesting "History of the Council of Constance," 2 vols., Amsterdam. Two years after he wrote an apology for this work, which had been severely censured by the latter, and to which he added a notice of the treatises of the most remarkable events during the interval between it and the Council of Constance, a learned and most accurate work, written with sufficient impartiality. 1724; 4, 4, A Volume containing sixteen Sermons, on different Texts of Scripture," 1728; 5, 5, "A General Preface to the Old and New Testaments," which is appended to the French Bible in octavo, published at Hanover and Leipzig in 1728; 6, "A small volume of Remarks on Gibert's "Treatise on Pulpit Eloquence." The last work of Lenfant is one which has greatly added to his already high reputation, "The History of the Wars of the Hapsburgs, and of the Council of Pavia," a remarkable piece of work, written in a most accurate and impartial manner. It is a detailed account of the events of that time, with particular regard to the relations of the Council and the Empire, and the most remarkable events during the interval between it and the Council of Constance, a learned and most accurate work, written with sufficient impartiality. The important details of the life of Lenfant have been taken from a memoir annexed to the above work:

LENTIBULARIÆ. [LENTIBULARIAE, P. C.]

LEPIS (from λεπίς, 'a line, and στειρός, 'a tail'), a genus of plants belonging to the natural order Labiate. The anthors approximate in pairs, with parallel colls and naked valves. The upper lip of the corolla is nearly flat, the lower one triated, with the middle lobe abraded. The calyx is tubular and 5-toothed; the nuts flatly truncate.

L. cardiacus, Mother-wort, is a bitter herb, with a pungent unpleasant smell. The stems rise from 2 to 3 feet in height; they are smooth, and armed. The leaves are long-stalked, somewhat downy, and of a dark green colour. The lower leaves are the broadest, and deeply jagged, the upper ones 3-lobed, and those about the summit incoarate and divided. The flowers are of a purple and externally hairy; the calyx rigid and pungent. It is found in hedges and waste places in Great Britain, all over Europe, and the middle of Asia. The reputed tonic powers of this herb are in reality inapparent. Bitters and cocktails, cardinals, or heartburn, are now disregarded: from being used however in the last complaint it derives its name. It has been extolled by the Romans as an antidote to curare madness, and bees are said to be fond of the juice. L. macrostemon has elongated pubescent branches, oblong ovate-toothed leaves, the calyx nearly glabrous, and the corolla small, white or pale-red, and shorter than the calyces, and which are subulate, spiny, and diverging. It is found in waste places throughout Europe and Asiatic Russia. There are eight species of Leucandra described by botanists as growing chiefly in Europe and the North of Asia. None of them are very ornamental, and being biennial plants, the seeds only require to be sown in the summer to ensure the perennial growth.

(Don, Gardner's Dictionary; Lindley, Flora Medica, Babington, Manual of British Botany.)

LEPIDIUM [LEPIDIUM, P. C. S.]

LEPIDIUM (from λεπίς, a scale, in allusion to the form of the pods, which resemble little scales), a genus of plants belonging to the natural order Cruciferae, and the tribe Cruciflorae. The most noteworthy is the common Lepidium, or Horsenail, which has the seed notched or entire, compressed valves, keeled or winged at the back. There is but one seed in each cell; the filaments are simple. The species consist of herbs or small shrubby herbs with small white flowers. This genus is divided into seven sections, the first of which, Cardaria, is so called from the heart-shaped form of the silicles. To this section belong:

L. draba. It has oblong leaves, entire or toothed, the lower ones narrowed into a footstalk, the stem-leaves sagittate and amplexicaule, the style as long as the disseminate. It is native in the south of Europe from Spain to Taurin, and from Greece to Paris. It was introduced into Great Britain probably by foreign seed, and is now found in the hedges of Kent.

L. sativum, common Garden Cress, belongs to the section Cardamom of this genus. It has orbicular pods, variously cut with winged leaves, those of both are toothed, and the pods and seeds resemble those of Lepidium and the island of Cyprus in corn-fields. There are three varieties of the species: the broad-leaved cress, which is cultivated chiefly for rearing young turkeys; the curled variety, which is sometimes considered preferable as a garnish; and the common plain-leaved cress, which forms one of our earliest spring salads, and has a peculiarly warm and grateful relish. All the varieties are raised from seed, of which one ounce will sow a square yard, and four square feet. Cress should be raised four or five times a month so as to have the crops delicately young in succession. When raised in the open garden it should be sown early in March, and if the weather be cold it should be either with matting or a frame during the night. Cress is often raised on porous earthenware vessels of a conical form, having small gutters on the sides for retaining the seeds. These are called pyramids; they are somewhat ornamental in winter, and afford repeated gatherings. This species is the Lepidium sativum. It has downy leaves, the upper ones toothed, the lower ones oblong and narrowed into a footstalk, the stem leaves lanceolate, sagittate, and amplexicaule. It is distinguished from the other species by the pod being ovate, rough, and covered with minute scales, notched and rounded at the end, the stem less than an inch thick, and the calyx. It grows on dry gravelly soil in Great Britain. L. sativum has ovate lanceolate leaves, serrated or entire; the pod is oval and downy. It has numerous small flowers in compound leafy racemes, the flowers of a purplish colour, also of Aligiers, and of several parts of England generally near the sea. It has a very hot biting taste, and has been used instead of horse-radish, occasionally as a salad; the poor people are in the habit of eating it as a condiment to their food, hence it has acquired the name of Poor Man's Pepper.

An infusion of it acts as an emetic. Fras. believes this to be the echium drupa of Dioscorides, 2, 147, although it is usually referred to the Brassicac cretis. It is also the Lepidium of Pliny, 20, 17. 19. 19.

The green-house plants will thrive well in any kind of light soil, and are readily propagated by cuttings planted in peat. They like to be kept under a half-glass roof, but may be sown in the open ground, or by dividing at the roots or by seeds, will grow in any kind of soil. The hardy annual kinds only require to be sown in the open ground. None of the species are worth cultivating in the garden.

(Ton, Gardner's Dictionary; Babington, Manual of British Botany; Fras, Synopsis Flora Classicvs; Burnett, Outlines of Botany.)

LEPIDOPTERANAE [LEPIDOPTERAE, P. C. S.]

LEPIDOPTEROSIUS, a genus of fossil insect flies, absent in the oolitic strata. (Agassiz.)

LEPIDOTA, a genus of fossil insect flies, absent in the oolitic strata. (Agassiz.)

LEPIDOSA, a genus of fossil insect flies, belonging to the oolitic strata. (Agassiz.)

LEPTA, a subdivision of the great family of fossil
devoted to the operations of the lustful passions on the charac-
ter of a man violent and unscrupulous in his nature, but under
the restraint of monastic vows. The young novelist drew the
character broadly and offensively; and the singular lubricity of
his performances, calculated by its baseness and admission to
the taste of novel readers to be extensively circulated, excited
much indignation. It is understood that the Society for the
Suppression of Vice applied to the Attorney-General to take
legal steps against the work, as a violation of his physical strength by
the author of his fame. At that time it was rather favourable to
the success of a work of genius that its morality was not per-
fected popular, and Lewis had the satisfaction of being a
much talked of and highly esteemed character as represented in his published letters, is singularly at variance
with that which might be derived from the study of his works.
He appears to have been good-humoured, simple, affectionate,
and not addicted to any vice. He had a very difficult part to
maintain in his intercourse with his parents, his mother having,
on account of her levities, long been separated from her hus-
band. Although he could not vindicate her conduct, he gave
her his kindest sympathies. It is a singular circumstance in
his life, that, after having lived for some time on bad terms
with his father, the latter dying in a temper which precluded
the son from any hope of succession, yet left him, with
slight exceptions, his whole fortune. This event made Lewis a
rich West India proprietor. He was very kind to his
slaves, and his occasional visits to his estates in Jamaica were
welcomed with great pleasure by the negroes. Though his portrait of the Emperor was
made of his own slaves and those in the neighbourhood of his estates. His
poetical pieces, including 'Alonzo the Brave,' 'Bill Jones,' &c., are well known: they are distinguished by the fluency of the
verses and the horror which they narrate horrible and
tragical incidents. There is, how-
ever, in all his writings, a tone of barbarous and exaggerated
taste. In 1812, he introduced to the stage the drama of
'Temour the Tartar,' which is said to have had much influence in
creating the taste for gorgeous pageants, from which the
British stage has for some years been struggling to relieve it-
self. Lewis died at sea, on the 14th May, 1818, when on the
way home from the West Indies, and is buried in St.
(Poonth and Correspondence of Matthew Gregory Lewis
8vo., London, 1830.)

LEYDEN, LUCAS VAN, a very celebrated old Dutch
painter and engraver, was born at Leyden in 1523. He was
first instructed in the arts by Hugh Jacobson, his father;
and afterwards by Cornelis Engelbrechtsz; and he distinguished
himself even as a boy by his engravings, and was a famous
painter as early as his twelfth year. He painted in ditemper
a picture of St. Hubert, in 1566, for a citizen of Leyden of the
name of Lokhorst, who was so astonished and grati-
fied at the excellence of the work, that he paid him twelve
guilder for it. He engraved, however, for the greater part time
doubtless a very large sum for a picture. Some of Lucas's
early engravings are highly prized by print-collectors, and
are possessed among the greatest rarities of their class: they
doubtless add more to their value, however, from the particu-
lar circumstances of their origin, than to any intrinsic merit
they may have. They are better as engravings than as works of
art. Vastu speaks highly of the prints of Luca d'Olanda,
as he is called by the Italians. He excelled in aerial per-
spective, but he was far surpassed by his two contemporaries,
Albert Durer and Marcantonio—in correctness of drawing
by the latter, and in execution and in drawing by the former.
Albert Durer visited Lucas at Antwerp in 1521, and he
makes the following note in his journal: 'I was invited
to dinner by master Lucas, who engraves in copper: he is a
little boy, but has a mind so exact that I have seen him
engrave during a journey which Lucas made through Zealand, Flanders,
and Brabant, for the sake of becoming acquainted with and
seeing the works of their various painters. The entry above quoted
for 1523, which mentions his engraving with great facility, is
fixed in my mind, and is the more so as it was from the
print of this journey six years earlier than the account of
Van Mander, who says that Lucas made it when he was about
thirty-three years of age, which, according to his own date of
Lucas, who was well to do in worldly matters, fitted up a
small vessel and sprung expressly for this journey; and at Middel-
burg, where he entertained the painters of the place with a
feast, he invited Durer to join him, and they made the excursion together, both
clad more like princes than artists. It was a succession of feasts,
and Lucas repeated the entertainment of Middelburg
at Ghent, at Antwerp, and at Mechlin. He, however, was
not less energetic in his pleasures than at his work, and he indulged
during this excursion in a round of dissipation which appears
to have lastingly injured his constitution: he was
never well afterwards. His own vanity led him to account for
his illness by the supposition that some of the women with
whom he had entertained had endeavoured to poison him, and he
added to his malady by indulgence and despondency. He
allowed his mind to fall into such a morbid state that his
health and strength rapidly decayed. He lived to the
last few years of his life in bed, or at least in the sick-
room, still, however, working at occasional intervals. He
died in 1565, aged only thirty-nine years.
Lucas's pictures are of course, they are in the old Flemish
style, but are among the best works of that school. They are
cleanest, expressively, deeply coloured, and executed with great
care; and are beautiful and highly interesting, notwithstanding
their Gothic forms and arrangement; in the perspective of
colour they are in advance of their time. The galleries
of Vienna, Berlin, Dresden, and Munich possess a few good
pictures by Lucas; his own portrait is in the Berlin Gallery.
There is a very small curious picture by him in the collection
of the Duke of Devonshire, at Devonshire House; it represen-
ta man having a tooth drawn, while a woman is picking
his pocket: there is a print of it, of the same size, by Lucas
himself, dated 1528. There is a picture also by Lucas at
Wilton House, and another at the Liverpool Institution.
Mr. Rogers, the poet, possesses a pen-and-ink drawing of the
portrait of the Emperor Maximilian, and which, according to Lucas
himself, is considered by some his best engraving. A picture of the 'Last Judgment,' one of his most remarkable works, is
still in the town-house at Leyden. The print of Eulenpiekels,
which was etched by the master after the four plates, which
are the rarest engravings in existence: there are said to be not more than
five or six of the original extant, but it has often been
copied, and the first copy was made in 1644 by Hondius,
when the price of the original, even at that early time, was
fifty fuchas; it is about six and a half inches high and rather
better than five wide, and represents a man playing the
bagpipes, with two children on his back, followed by a woman
who is also carrying a child, and is leant upon an arm supported
with two panniers in which are three other children; the
whole family is preceded by a small figure dressed in a cow,
with a stick in one hand and a jug in the other, an owl on his
shoulder, and a dog walking before him—this is Eulenpiekels;
it was engraved in 1520. Bartch, who published a
distinct catalogue of the prints of Lucas van Leyden, des-
cribes 174 engravings by him; in all, including wood-cuts,
his prints amount probably to about 2000.

(Van Mander, Het Leven der Schilders; Bartch, Cata-
logue Raisonné de tous les Estampes qui forment l'Œuvre de
Lucas de Leyde, and Peinture Groover, vol. vii.; Huber,
Manuel des Artistes, Stuttgart, 1825; Van der Meer, Geschicht
der Kupferstecher-kunst; Van Eynden and Van der
Willigen, Geschiedenis der Vaterlandische-Schilder-kunst,
&c.)

LIBEL. [Libel, P. C.] The Act of 6 & 7 Vict. c. 96, entitled 'An Act to amend the law respecting defamatory
words and libel,' has made some alterations in the law of
defamation and libel. The Act commences with the preamble,
For the better protection of private character, and for more
effectually securing the liberty of the press, and for better
preventing abuses in exercising the said liberty, be it enacted,' &c. The Act enacts—§ 1. That in any section for
defamation it shall be lawful for the defendant, subject to a
certain notice in writing therein described, to give in evidence
in mitigation of damages, that he made or offered an apology
to the plaintiff for such defamation with which he was
charged without actual malice and without gross negligence,
and that at such time as the section mentions he inserted in such
newspaper or other periodical publication a full apology for
Lucas, or of the said libel, or of any other apology as in the said
section is more particularly described.
§ 2 enacts, That in any action for a libel contained in any
public newspaper or other periodical publication, it shall be
competent to the defendant to plead in mitigation of damages
the charge without actual malice and without gross negligence,
and that at such time as the section mentions he inserted in such
newspaper or other periodical publication a full apology for
Lucas, or of the said libel, or of any other apology as in the said
section is more particularly described.
§ 3 enacts, That if any person shall publish any libel upon
any other person, or shall directly or indirectly threaten to
print or publish, or shall directly or indirectly offer to prevent the
printing or publishing of any matter or thing touching any other person, with intent to extort
any money or security for money of any valuable thing from

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by the circumstance of his becoming free that he became a citizen, though positive law, as among the Romans, might invest the degree in which he thereby obtained citizenship. (Curtius, P. C. S.) Slavery may and does spring from the growth of antiquity which were under monarchical or tyrannical rule; but he who was the slave of an individual in any such state, and obtained his freedom, did not thereby become a citizen, but was merely released from the duty that he owed to the lord of his person; the master: he still owed together with others the duty of perfect obedience to an individual monarch or tyrant.

The words liberty and freedom, in political terms, have always been used to express a condition of a people in which they are to some degree at least secured against the arbitrary rule of an individual or of a small number of persons; and the word slavery, in the same sense, is used to express the condition of those in which the mass of the people have not reasonable security for their lives and property against the capricious rule of one man or of a number of persons who form a small minority of the whole.

That which is really meant by political freedom and liberty is nothing more than a form of government which shall in some degree at least secure to the people the enjoyment of life and of their property against the tyranny of one man or of a few. Freedom and liberty then are terms which can only be applied to constitutional governments (Constitution, P. C.), and to republics, in the proper sense of that term. There is no political liberty or freedom under any other form of government, though under a monarchy, when the administration is good, there may be in many respects more personal freedom than there is in a pure democracy. But the essential quality by which a free government is distinguished from this: the sovereign power is not in the hands of one or a small minority, but it is either distributed among the whole community or a considerable part of it.

Political liberty does not exist in some civilized nations in Europe, in Prussia for instance. Political liberty does not exist in Russia. In some countries where it does not exist, it is the general opinion that its existence would be a benefit to the whole nation. In other countries the masses of the people are still in such a condition that political liberty could not exist, for political liberty, as already stated, means, that the sovereign power must be in the hands of a large number, and they must possess intelligence enough to enable them to exercise and keep the power; but there are nations where the mass of the people are too ignorant to exercise or keep any political power.

The highest degree of political liberty is in a Democracy (Democracy, P. C.): for it is that form of government which is furthest removed from a monarchy. The relationship of monarch and subject is the like relationship to master and slave.

A nation which strives for its liberty strives for a popular form of government, whether it be a constitutional kingly form or a true democratic liberty. A feeble form of liberty is but a feeble form of government. A strong nation has understood; and many who have cried out for liberty have either not considered exactly what it is they want, or they have supposed that liberty would free them from many evils of which they considered it to be a state of dependence. It is now generally admitted, that in those states where a large part of the population have equal political knowledge with the few, who direct administration, the general interests are best served by this large number participating in the government. Political liberty then, to some extent or degree, is, in many countries, necessary for securing the advantages of good administration. But there are many evils incident to states which are not due to the want of political liberty; and it is therefore a matter of importance for those who would make changes in government to consider whether the evils of which they complain are owing to the want of political liberty or to other causes.

The notion of political liberty has been based upon the analogy already pointed out between Political Liberty and Personal Liberty; which is a false analogy, though it has an historical one. Man, it has been assumed, is naturally free. No man is naturally or by nature another man's slave. As no man, it is said, is naturally a slave, so all mankind have naturally a right to be free. But government, it is said, arises from the consent of the governed.

On these assumptions rests the American Declaration of Independence: We hold these truths to be self-evident: that all men are created equal; that they are endowed by their Creator with certain inalienable rights; that among these are life, liberty, and the pursuit of happiness: that to secure...
these rights governments are instituted among men, deriving their joint powers from the consent of the governed, &c.

In this passage is the Pyrrhic Law, which is opposed to slavery; and it is on the assumption of the equality by birth and the endowment of all men with certain inalienable rights, that this instrument would found the American Political Liberty. He introduces the doctrine of the social contract, and assumes, as an historical fact, an origin of governments by consent of the governed. It was also promulgated in a country in which a very large number of people have always been slaves; and these governments have been constituted without the consent of the governed. These are real facts: those assumptions are untruths.

Political liberty rests on no such sorry basis as the Declaration of Independence places it on. That nation which can obtain it and maintain it is in a better condition than if it were politically a slave, even to the wisest of masters; and when it is able to obtain and maintain that liberty, it is right, or in other words it is for the general interest, that a nation should, by force if necessary, alter that form of government which is political slavery.

Plutarch promises to be most stable which is the growth of long time and the result of a perpetual struggle between a master and his slaves, in which the master has not ceased to be master all at once, but has always lost something in the contest.

That which is of sudden growth or is the offspring of Revolution, is often premature, and always insusceptible; for liberty so acquired may only be a step from a state of political slavery to a more wretched state; it may be a step from a state of slavery, mild and tolerable, to anarchy, which of all things is most intolerable.

The words Liberty and Equality often go together, and each of them in so doubtful a sense that one hardly knows what to make of them. Liberty is often used, apparently without people considering what they really mean, in the sense of freedom from restraint. But this kind of Liberty is inconsistent with Political Liberty properly understood; and all men's liberty of action is and must be restrained by positive laws in every well-ordered community. Every law that forbids any act directly or by implication abridges Liberty, and such abridgment is always a universal benefit when the law which so abridges liberty only abridges it in cases where it is useful to all that it should be abridged, and where the law is so framed as to accomplish that object. Equality, in its unlimited sense, can no more exist in any state than perfect individual liberty; for if each man is left to exercise his industry in the best way that he can, without interfering directly with that of others, some will be richer, and happier, and wiser than others. The only Equality that can be approached to in a well-ordered state is that Equality which is the result of a good policy, which policy, so far as it is consistent with political good, is to every citizen equal in the State the free enjoyment of his industry, wealth, and talents, imposes restraint on all alike, and makes all alike bear the burden of taxation and of the services due to the State. Further, it gives to so large a number as it can, consistently with the universal interest, an equal share in the sovereign power; but no policy that has ever yet been framed has ever given an equal share in the sovereign power to all the members of a community; such an Equality is impossible.

The Declaration of Rights published by the French National Assembly in 1791 contains the words 'free, equal, rights, liberty,' and many others, all of which are used in a meaning so remote from the meaning of the words so understood suggests.

Strange samples of nonsense have been examined and dissected by Bentham in his 'Anarchical Fallacies' (Bentham's Works, part viii., Edinburgh, 1818).

The word Liberties is often used to express those particular constitutional principles or fundamental laws by which political freedom is secured in a nation. The British parliament should attempt to maintain the triennial bills, the standing army, the habeas corpus, or the Habeas Corpus, an such an attempt would be called an attack on the liberties of Englishmen.

LIGATURES, in Anatomy, the organs by which the various articulations of the animal body are held together.
LIGHTS, ARTIFICIAL. Within the last few years many improvements have been made for the illuminating of apartments—by candles, by lamps, and by a sort of combination of both. The modes of illuminating large buildings have been most improved by the use of Gas, and Lamps, P. C. S.; and DRUMMOND LIGHT, P. C. S.; while the articles AROUND, P. C., and CANDLE, P. C., illustrated the common modes of domestic lighting. The recent inventions may be classed thus:—1. Candles; 2. Candle-Lamps; 3. Oil-Lamps; 4. Spirit-Lamps.

1. Candles.—Dr. Ure, in the Supplement to his Dictionary of Arts, describes the mode adopted by Messrs. Hempel and Blundell, for making candles of palm-oil, margaric acid, and stea-

ric acid or stearine. The palm-oil is melted in an iron pan, and then cooled gradually, by which it is separated into a liquid oleine or oil, and two solids, stearine and margarine. The oil being then boiled, the stearine is thrown out; the oil is afterwards mixed with quicklime, and the mixture is afterwards brought to a granulated state by the action of cold water. Muriate of lime and sulphuric acid are then employed to separate the quick-
lime from the stearine, after which the stearine is washed in water until it is cooled, and crystallized, are pressed, whereby the stearine is separated from the margarine. The two are separately bleached; and, having further reduced in size, until it assumes the form of a pure and solid kind of palm-wax or hardnaded tall, fit to make into candles in the usual way. The margarine, or margaric acid, obtained in this way, is mixed with common tall to make another sort of candles.

Palmer's candles differ in many points from those in common use. In a patent obtained for them in 1842, one of the arrangements was intended to make the wick bend out of the flame. This was accomplished by a tube let into the wick, and thereby render the troublesome process of snuffing unnecessary; this consisted in impregnating one side of the wick with common paste or starch, which gave a greater stiffness and less combustibility to that side of the wick than the other: this inequality of action gave a bending tendency to the wick. The same object is, however, now attained by having the wick in two halves, twisting spirally round each other; each half is bound round in a tolerably compact form; and the process of twisting the spiral, by the gradual burning of the candle, causes the tops of the two wicks to spread out, and so form a wick of large diameter. Another mode of introducing the wick into candles, and a small apparatus for preventing the guttering of candles, formed part of the patent of 1842.

The circumstance of palm-oil being in a solid state in our climate, coupled with the ascertained mode of separating it into three different substances, oleine, oleic, and margarine, has led to many suggested variations in the mode of making candles, by the mixture of one or more of these component substances either in the palm-oil, or afterwards. There have also been patents taken out for new varieties of wick, and for new forms given to the candle; but these do not involve any features which call for much notice.

2. Candle-Lamps or Oil-Lamps is a designation under which may be grouped many recent contrivances, having for object the burning of solid tallow or fat instead of oil, but without having the tallow formed into a candle.

3. Oil-Lamps.—One of the difficulties which have lessened...
The usefulness of common oil-lamps is the tendency of the oil to thicken in cold weather; while another lies in the imperfection of the means for keeping the wick well moistened with oil up to the verge of the flame. Both of these matters have exercised the ingenuity of the last few years. Dr. Ure remarks (p. 184), 'The great cost of light from superheated oillamps is the waste of stearic candles, as also the nuisance of the light from tall-lamps; they also have to the invention of an endless variety of lamps, of which the best hitherto known is a small copper or Carcel lamp, so generally used by the opulent families in Paris. In this lamp the oil is raised through tubes by clockwork, so as continually to overflow at the bottom of the burner, and yet circulate in the lamp while the excess of the oil drops back into the cistern below.'

There is a lamp called the Meteor lamp, having some of the properties of the Carcel, but intended to burn rape-oil. The internal arrangements of this lamp are curious and complicated. The lower part of the pedestal consists of a reservoir for containing the oil; and in this reservoir is a kind of piston or plunger, worked up and down by a nut and screw from the outside; the rising of this piston occasions the pressure or tightening of a coiled spring, and this pressure causes the oil to be forced up a central tube towards the flame. The admission and regulation of the oil to the lamp, the adjustment of the wick, the clearness of the lamp and for admitting draught, and of the gallery which supports the glass chimney, are all of an intricate kind, and, whatever may be their excellency while in good order, would render the repair, in case of accident, a difficult business.

One of the modes adopted for maintaining the oil in a liquid state, is by the use of a lamp constructed by Mr. Parker, in which the lamp is kept hot in a warm room. The whole of the oil is in a hot state. At a small distance around the tube which contains the oil, there is a hot pipe, and the space between the two tubes, of capacity sufficient to hold a pint, constitutes the reservoir for the oil. The oil is thus so near the flame, that it speedily becomes warm, by which its facility of burning is much increased. A slide-valve is opened to allow the oil to descend from the reservoir to the lamp. The intensity of the flame is modified by raising or lowering a wire, placed in the beam of light, and held by magnets. In a series of experiments on the illuminating powers of different kinds of lamps and candles, Dr. Ure found that the hot-oil lamp, with a given quantity of oil, gave a brighter light than any other form of lamp; or, the light being equal in intensity, the hot-oil lamp was the most economical. This corroborates, so far as it goes, the remarkable results obtained by the hot-blast in the iron manufacture.

Argand's principle of the mode of admitting air to act on the wick has been the one most generally followed since his time; and many of the subsequent inventions have had relation more or less to some modification of this arrangement. The Solar lamp, one of the earliest of this class, has so for some time been used in Paris, as in the Argand; but the action of the air on the exterior of the wick is more directly felt, the number of holes in the centre of a cap or cone, and the air is admitted to the flame close to the hole, and in a horizontal direction, while the flame is yet small; so that the exposure of the gaseous products to the action of the air in mixture is much more complete. Many improvements have been introduced from time to time; but the solar lamp remains in principle an Argand, with the addition of a cap or cone to the exterior, and the combustion more complete. Many of the modern variations in lamps and in gas-burners have had relation to this circumstance of admitting the external air to act at the points and in the quantity found best for the maintenance of the flame.

4. Spirit-Lamps.—In chemical experiments the spirit-lamp has long been a valuable piece of apparatus; but the use of spirit instead of oil, as a fuel for lamps intended for domestic purposes, is a modern innovation, and has led to much mechanical ingenuity in the construction of the apparatus.

The word spirit is rather a vague one, since there are many kinds of spirit, and may be used to be enough for this purpose; but the kind alluded to in the spirit-lamp of Turpentine, or that liquid which is distilled from common turpentine by being separated from the resin which is a component ingredient of the same; and hence the name for some of the modern spirit-lamps. Turpentine being a very abundant produce of the American states, camphene has been long in use in the United States for lighting shops and public buildings, and it seems to have been from that country that the practice was borrowed and introduced into England. When the import duty on turpentine was lowered two or three years ago, the price became reduced sufficiently to direct the attention of lamp manufacturers, and they have been substituting a substitute for oil. Many different forms of lamp have resulted from these inquiries; and different processes have also been adopted for freeing the turpentine from a small quantity of oxygen which is troublesome while the supply is added. Young's Vest, lamp is one of those varieties. In the specification of the patent it was stated that the lamp is constructed for burning rectified spirits of turpentine, or camphene; that, on account of the very fine and fiery nature of the liquid, provision is made for keeping cool the reservoir where it is deposited; that no tube or metal conductor of any description is allowed to pass into or through the liquid from the burning part of the lamp; that a non-conductor of heat is placed between the burner and the liquid; that the cotton wick hangs down from the burner into the spirit, so as to supply spirit to the flame by capillary attraction, without the intervention of any metallic or conducting substance; that the admission of air to the interior of the wick is managed without the necessity of passing an air-tube through the liquid. All these features and a few others are rendered necessary in the camphine or spirit lamps, on account of the very fine and fiery nature of the liquid; an incompatibility such that the arrangements for an oil-lamp would not be available for a camphine-lamp without much danger.

Whether these camphine-lamps receive the name of 'Vesta,' or 'Gen,' or 'Heron,' or 'Princess,' or 'Paragon, or any of the many which have been applied to them, they all present in common a reservoir, generally of glass, placed between the supporting parts of the lamp, the O-rings, which contain the liquid, and a cotton wick is suspended over the liquid. The chief points in which the several varieties of the lamp differ are in the arrangements for admitting air to the flame.

Of one of these lamps, the 'Vesta,' Dr. Ure states, that 'burning with its utmost brilliancy, without smoke, it emits a light equal to very nearly twelve wax or spermaceti candles of three or four to the pound; and in so doing it consumes exactly one halfpenny worth of camphene in six minutes (value sixpence) in ten hours; hence the cost per hour for a light equal to ten such candles is one halfpenny.' Since that statement was written, the demand for camphine has raised its price, and the relative advantages in its favour are therefore smaller; but it still remains much cheaper than any form of candle or oil-lamp, in relation to the quantity of light yielded. All lamp-oils contain some oxygen, which neutralizes a part of the hydrogen and carbon, and also some oxide or other substance which damps the brilliancy of the flame; whereas rectified camphine, being composed almost wholly of hydrogen and carbon, contains nothing but what is susceptible of combustion. Whether it be called a spirit-lamp, or a lamp of the feet combustion, and also so as to avoid danger, are questions for the manufacturer; but in a scientific point of view, camphine seems to be the best, and camphene, for the reason that it is not alone from turpentine that the spirit may be procured; for tar and naphtha also, if subjected to careful distillation and rectification, will yield a spirit or camphine differing but little from that yielded by ordinary spirit-lamps.

A few words may here be added concerning two important features connected with lamps, viz., the comparative illuminating powers of different kinds, and the means of carrying off the products formed by the flame.

Pectet, Dr. Ure, and Frye have all instituted experiments bearing on the former of these two questions. Pectet experimented on candles only. He determined what would be the value of different kinds of candles, sufficient to produce a given intensity of light, as determined by Carcel's lamp as a standard. They rank in the following order, the first being the cheapest:—tallow candles, six to the pound; ditto, of eight to the pound; pressed tallow; stearine; spermaceti; wax. This relation was as to price only; the relative weights of material consumed followed a different order of arrangement, the spermaceti and tallow being the least economical. In Dr. Ure's list ('Supplement to Dictionary of Arts') the relative quantities of light for a given price, or the relative cheapness of a given quantity of light, among several kinds of lamps, and also the relative advantages of the following order:

- Hot-oil lamp, with southern whale-oil.
- Carcel lamp, with sperm-oil.
- Hot-oil lamp, with sperm-oil.
- 'Gen' lamp, with cocoanut-oil,
French lamp, with spern-oil, mould tallow candles, Pale wax candles, stearine candles, cocoa-nut stearine, spermaceti candles, and wax candles, the first being, in point of economy, the cheapest, and the last the dearest.

Dr. Fyle's experiments ('Transactions of the Royal Scottish Society of Arts') seem to have been of a more extensive character, embracing a larger number of sources of illumination. Assuming a given intensity of gas-light as a standard, he experimented on ten varieties of candles, and found their relative cheapness in producing the given degree of light, to rank as follows: tallow with singlewick, cocoa, composit, palm, tallow with double wicks, wax, diaphene, margarine, spermaceti, and composition. In another table, comparing gas, oil, and candles together, he assumed Argand gas-flame as a standard of intensity and price, and gives the following arrangement in respect to the ratios of relative cheapness, the intensity of light being uniform:

| Argand gas-flame | 1:00 |
| Solar lamp | 1:04 |
| Naphtha | 2:00 |
| Solar oil in Argand lamp | 3:98 |
| Whale-oil | 5:00 |
| Spern-oil | 6:50 |
| Tallow candle (two wicks) | 12:70 |
| Cocoa candle | 13:10 |
| Tallow candle (one wick) | 14:50 |
| Composition | 15:50 |

According to this table, composition candles are nearly thirty times more expensive for an equal intensity of light.

Dr. Faraday has introduced an important arrangement for carrying off the products of combustion in gas and oil lamps. This arose out of a complaint, on the part of the members of the Athenaeum Club, that the air of their library was vitiated and the binding of the books injured by the lamps then used. Dr. Faraday investigated the subject, and shortly afterwards communicated to the Institute of Civil Engineers the mode which he proposed to adopt for removing the evil. In a paper communicated to this body (Session 1848) he adduced striking proof of the magnitude of the product resulting from combustion. Oil and gas each contains carbon and hydrogen, and each reduces the same volume of oxygen to bring about combustion. The light is one of the indications of the intensity of this union; and the substances which result from it are mainly carbon, by a combination of some of the oxygen with the hydrogen; and carbonic acid, by the combination of more of the oxygen with the carbon. The quantity of these two substances produced, owing to the enormous absorption of oxygen during the combustion, would by many persons be deemed quite extraordinary. A pint of oil, when burned, produces a pint and a quarter of water, and a pound of gas more than two and a half pounds of water; the increase of weight being due to the absorption of oxys more than the atmosphere, one part of hydrogen taking eight parts (by weight) of oxygen to form water. A London Argand gas-lamp, in a closed shop-window, will produce in four hours two pints of water, and a pound of oil also produces nearly three pounds of carbo acid, and a pound of gas two and a half pounds of carbonic acid. For every cubic foot of gas burned, rather more than a cubic foot of carbonic acid is produced.

As the water produced deadens the effect of the flame, and as the carbonic acid is very deleterious to the lungs, Dr. Faraday contrived a contrivance confining both off allowing them to pass with the air of the room. Air is admitted to the flame, nearly in the usual way; but when the products of combustion have arrived at the top of the glass chimney, the air is entirely cut off from the chimney and the air of the room, so that they are compelled to pass down between the chimney and another larger glass chimney concentric with it. The open space between the two chimneys communicates with a pipe which is conducted in any convenient way into the open air; the carboxylic acid, aqueous vapour, smoke, and other emanations from the flame have no means of escape except through this tube, and their effect is thus wholly cut off from any contact with the air of the room. The mode of carrying out the arrangement may be varied in its details; but the general result is said to be that the light is brighter, the space around the lamp cooler, and the air of the room less vitiated than when common open burners are used.

Ligozzi, JACOPO, a distinguished Italian painter in fresco and in oil, was born at Verona, where he was studied under Paolo Veronese. He established himself at Florence, where he had much influence upon the painters of his time, especially in colouring, for though not equal to Grand Velasquez, Ligozzi was of the first rank and possessed the same gift for the same time that he added vigour to the colouring of the Florentines, he improved his own drawing. The Grand Duke Ferdinand II. appointed Ligozzi his principal painter, and superintendent of the Imperial Gallery. He died in 1697.

Ligozzi is the painter of several great works in oil, though they are what the Italians call quadri di macchina or machines, that is ornamental or decorative works, distinguished chiefly for their size and effect on the spectator. The following works, however, are of a superior order of this class—San Raimondo resuscitating an infant, in Santa Maria Novella; the four crowned Saints,—St. John the Baptist,—Gli Scalzi, or the barefoot friars, at S. Marco; and the Martyrdom of St. Dorothea, at the Conventual Friars, at Pescia. Ligozzi executed also many small highly finished easel pictures. Augustin Caracci engraved some of his works.

Ligustrum, a genus of plants belonging to the natural order Jasminaceae. It has a feathly, the berry containing two membraneous or compressed nuts. The calyx is short, tubar, four-toothed; the corolla of the flowers is white and spreading; stamens 2, with short filaments. The species are shrubs or low trees, natives of Europe and Asia.

Ligustrum, Common Privet, has elliptic lanceolate glabrous leaves; compound racemes; sweet-scented flowers, white at first, soon changing to a reddish brown. The berries are dark purple, almost black. It is a bushy sub-evergreen shrub, growing in hedges and thickets in Great Britain, and native of the South-west of England. This plant was formerly called Prim, or Prim(sqrt), from its being used for verdant sculptures, or topiary-work, and for primly cut hedges. The common English name Privet seems to have been given to it from its being frequently planted to conceal private places. In German, Dutch, Danish, and Swedish it is called Ligistrum; in French, Troène; in Italian, Liguostro; in Spanish, Alhena; and in Portuguese, Alhena. It is probably the Ligustrum of Theophrastus, 'Hist. Plant.' 1, 14. In point of utility and ornament few shrubs exceed the privet. Its chief use is to form hedges either for shelter or ornament. It bears cutting well, and it is not liable to be destroyed by rabbits has numerous roots, and robs the ground less than almost any other shrub. It is one of the few plants that will grow in the smoke of London; it also thrives under an abundance of moisture. The wood is hard and fit for timber. From the pulp of the berries a colour pigment may be prepared; with the addition of alum they dye wool and silk of a good durable green. The following varieties are those found chiefly in our gardens:

- L. v. nivosecarpum, the white-barberry privet.
- L. v. corniculatum, the yellow-barberry privet.
- L. v. chlorocarpum, the green-barberry privet.
- L. v. sempervirens, the Italian privet.
- L. v. variegatum, the variegated-leaved privet.
- L. v. angustifolium, the narrow-leaved privet.
- L. v. × lasianthum, lisanthes tomentose leaves, white flowers, and very small brown berries. It is a native of China, near Canton.
- L. Japonicum is a native of Japan, with oblong ovate grooved leaves, and white flowers growing to the height of six or eight feet.
- L. prostratum has elliptic acute leaves, hairy beneath, as well as the branchlets. Flowers crowded, almost sessile, spicate, disposed in threes, hairy, having the minute bracts. It is an evergreen shrub, native of Nepal, on mountains, growing from six to eight feet in height. All the species of Privet are of easy culture, and will grow in any soil, whether rich or poor. L. lucidum requires some protection in the winter.

(From, 'Gardener's Dictionary'; Babington, Manual of British Botany; Frans, Synopsis Plantarum Classica; Loudon, Encyclopedia of Trees and Shrubs.)
LILAC. [Syringa, P. C.]
LILIUM (the Latin Lilium, and Greek Lépis, a genus of plants the type of the natural order Liliaceae. It has a perianth of six leaves spreading or reflexed, with a longitudinal groove facing the axis, a bulb, a smooth corolla, a petal of a beautiful shining white on their inside, ridged and not quite so transparent or luminous on their outside. The flowers are large, white, and in a cluster at the top of the shoot. The species early in the summer has been cultivated in our gardens from time immemorial. Great doubts had existed respecting the native habitat of this species, till Mr. Hawkins, the friend and companion of Dr. Slothrop, found it growing wild in that classical and celebrated spot the Vale of Tempe. It is the ssp. of Theorouc (Id. 23) and of Dioscoreides (3. 106). Both Pliny and Ovid have added their testimony to the general admiration in which this plant has been universally held. The flowers have a pleasant sweet smell, and were formerly used for medicinal purposes, particularly as an antiepileptic and anodyne. A water distilled from them had reputation as a cosmetic, but the odorous matter is so exceedingly volatile that it is impossible to preserve it, as it is wholly carried off by evaporation. The roots only are found available in medicine, and they are frequently employed as emollient poultices, owing to the mucilaginous nature with which they are encased. Whether they are also useful for the treatment of the eye, it is not possible to determine, whether they are more efficacious than poultices formed of bread or farina. Gerard prescribes the leaf internally in dropsy, and for this purpose bread was made of barleymeal mixed with the leaves, and eaten for two or three days, for a considerable length of time. This species, as well as others, is cultivated in Siberia and eaten as the potato. The scent of the leaf is exceedingly powerful, and peculiarly distressing in some cases. Murray mentions an instance of death ensuing from exposure to the odour of this plant.
L. bulliflorus, Bull-bearing or Orange Lily, has linear-lanceolate leaves, a bell-flower, a smooth erect corolla, glabrous and rough on the inside, without any scent. The bulb is composed of numerous thick white loosely imbricated scales. This species and L. chalecolemonis is probably the ssp. of Theophrastus, Hist. Plant, 6, 6, and undoubtedly the ssp. of Dioscoreides, 3. 127. It is a native of Italy, Austria, and North America.
L. superbum, Superb Martagon Lily, has a revolute corolla, the lower leaves whorled, the rest scattered. The flowers form a branched reflexed pyramid, and are large and handsome, of a yellowish red, with dark red spots; their smell is disagreeable. The bulb is as white as ivory. It is a native of North America, whence it was imported by Mr. Peter Collinson in the year 1736.
L. helicoid, has white spirillic lanceolate leaves, pubescent scabrous stem, nodding flowers, and a reflexed perianth. Though not a native of Great Britain, it is naturalised in copses in many places.

The species enumerated are those most commonly cultivated in our gardens, each of which has many varieties and sub-varieties. They are capable of being propagated by planting the offsets of the roots, and by sowing seeds to obtain new varieties. Every year the roots produce many offsets, which, however, unless greatly wanted, are best left on for two or three years. The proper time for separating them is in summer or autumn, when the winter has decayed, either by taking them from the mother bulbs in the ground or removing the whole and dividing the offsets from the main bulb when uncovered; they should then be planted in beds a foot or three inches deep, to remain a year or two; the large roots set again in the borders singly.

The sowling of seed is chiefly practised to obtain new varieties of Martagons; it should be done in the autumn, soon after the seed is ripe, in pots or boxes of rich light earth, with holes in the bottoms half an inch deep; the pots or boxes should be placed in a sheltered position during the winter and refreshed oftentimes at first with water; the plants will flower the following year; and should be transplanted into nursery beds in flat drills an inch deep and three or four inches.

After having grown in this situation till the August or September following they should be again transplanted into another bed, and at greater distances; after which they may be finally removed into the pleasure-ground. The bulbs should be planted singly, as they soon increase by offsets into large bunched. All the species and varieties of Liliaceae are valuable as plants of ornament for the flower and rock garden, to fill and beautify the borders, and the scenery at gardens and country seats; they are proper for the pleasure-ground, and if planted with judgment, succeed each other in blooming upwards of three months. The common white lily, the orange lily, and marbled lily are very showy. The orange-lily answers well for small gardens and confined situations in towns and cities.

(Dahlgren, Manual of Brit. Botany: Fras, Synopsis Plantarum Flora Britannica, and British Flowers, which has been edited by Mr. Hodgson.)

LIMBURG, a town in the province of Liege, in the kingdom of Belgium, situated in 50° 40' N. lat. and 6° E. long., on the Wesel (Wesere). It is a fortified town with two gates, on a mountain, at the foot of which is the suburb of Dalhem or Dolham. This suburb is larger than the town; both together have 3000 inhabitants, who manufacture a considerable quantity of fine linen. There are marble-quarries in the neighborhood. The railroad from Brussels to Aix-la-Chapelle passes near Limburg.

(Hassel, Handbuch; Stein, Lexicon.)

LIMBURG ON THE LAHN, situated in 50° 29' N. lat. and 6° 8' E. long., in the province of Nassau. It is the seat of a Roman Catholic bishop. It lies on the river Lahn, over which there is a stone bridge. It has a mint and four churches, of which St. George's Church is deserving of notice. The inhabitants are engaged in the manufacture of earthenware, and carry on a considerable trade in the productions of the country.

(Cannabich, Geography; Stein, Handbuch, by Hörselmann.)

LINA'BRIA (from Lina, flax, owing to the similarity in the leaves), a genus of plants belonging to the natural order Scrophulariaceae. It has a 5-parted cup, yellow or copper-colored corolla, the lower lip 3-fid with a prominent palate clasping the mouth. The capsules open by valves or teeth at the top. The species are annual or perennial plants, very rarely small shrubs, and there are usually 5 lobes, which are round, sparsely racemose at the tops of the branches.

L. Cymbalaria, iry-leaved toad-flax, has roundish heart-shaped leaves, 5-lobed and glabrous; the stem is procumbent, slender, and rooting. The flowers are solitary, axillary upon long stalks, and of a pale blue colour. It is a native of Europe, chiefly on old walls. It grows abundantly in Italy and Sicily, and is found in Great Britain. There are several varieties of this species.

L. Elatine, balberted-leaved toad-flax, has ovate hastate leaves, the lower ones ovate, the peduncles glabrous, stem procumbent; and the spur straight. The flowers are solitary, on long slender peduncles, yellow or brown, the spur hairless, and the stem procumbent. The appearance of this plant is similar to the last, but the flowers are larger, and the whole plant not so slender. It is native throughout Europe in corn-fields, and is found in Great Britain.

L. pulchella, known by its racemose flowers, which are of a dark purple colour with darker veins. It is native of the south and middle of France and of Great Britain.

L. repens, is distinguished by its lanceolate sepal and angular seed with transverse elevated lines. The flowers are of a bluish colour, the stem erect, branched, and leafy. The seeds are much smaller than either of the following species. It is found on calcareous soils, particularly near the sea, in Great Britain, in a town in the district of Cork, in Ireland; it is also native of Switzerland, Italy, and Hungary.

L. vulgaris has ovate acute glabrous sepal, shorter than the capsules, and the spur. The flowers greatly resemble
LINCOLN, PORT. [SOUTH AUSTRALIA. P. C. S.]

LINDSAY, SIR DAVID, a Scottish poet, was born at Garmynol, in Haddingtonshire, about the end of the fifteenth century. He inherited from his father the estate of "The Mount," in Fifeshire, whence, to distinguish him from many others of the same name, he is usually called Sir David Lindsay of the Mount. In the year 1512, he was appointed ser-
vior, or gentleman launer, to the young prince of Scotland, afterwards James V. His duties seem to have been of the most servile kind,—he had not only to attend the person of the infant prince, and see that he was properly attended to, but also to have himself exercised the craft of nursing. He says,

When thou wert young, I bore thee in my arm And on thy back, though ill thou didst grumble, And in thy bed off haply thee warm, Wrote thee in thy manhood ever so sickly; Some time in daubing sorely I fang, And sometimes playing fuses on theloor, And sometimes on my own taking care.

There is little doubt that his genius and good-humour must have made him a very animated and delightful companion to his charge. He seems never to have been entranced with the education of the prince, which was placed in the hands of a much graver personage—Bishop Gavin Dunbar. Lindsay's name is connected with a curious and poetical incident. He is the authority on which his kinname, Lindsay of Pitscottie, in his "Chronicles of Scotland," describes a spectral apparition which, in 1513, appeared to James IV, in the church of Linlithgow, and warned him against that campaign which terminated so fatally in the battle of Flodden. Sir David professed to have seen the apparition approach and vanish, and described him as "one man clad in a blue gown, belted about him with a roll of linen cloth, a pair of bootkins on his foot to the great of his legs, with all other clothes con-

The 'Dreme,' supposed to be the earlist of his writings, appeared in 1528; it is a satire on the times, representing a vision of the punishment of the prevailing iniquities in the other world, and is looked upon as a part of the Papage. 'Complaint of John the Commonweal'; 'History of Squyer Meldrum'; 'The Monarchie'; and 'The Play, or Satire, on the Three Estates.' There is little sentiment or pathos in Lindsay's work. In his "Joces of Joces," his principal quality. All that was powerful in the country came under his lash, and it is one of the most inexplicable circumstances in literary history that he should not have been the victim of his audacity. He particularly excelled in his attacks on the priesthood and the corruptions of the court; and after the Reformation his name was long popular as that of a relentless champion. The Satir has on the Three Estates stands half way between the Satiri of the fifteenth century and the latter part of the sixteenth century. It was sometimes acted in the open air, and could not have failed strongly to excite popular feeling against the corruptions, civil and ecclesiastical, which it undertakes to expose. Last, the preservative proof,' says Sir Walter Scott, 'of the liberty allowed to such representations at the period, that James V. and his queen repeatedly witnessed a piece in which the corruptions of the existing government and religion were treated of with singular justice and striking effect. Another feature that makes the circumstance of Lindsay's performances having such an audience, seem strange to those of our broad indolent habits, is the certainty that he was certainly beyond that of the other writers of the age, for 'Davie's say,' as he was long called in Scotland, seems to have had an innate liking for what was improper. His 'Squier Meldrum' is the most concise history of adventure, some of which exhibit a very loose and dangerous morality. Lindsay held the office of Lord Lyon King at Arms. In 1587 he has the task of preparing some masques or pageants to celebrate the arrival of Mary of Guise, queen of James V. The time of his death is not known, but it is said to have been alive in 1567.

(Lord Lindsay, Lives of the Lindsay; Irving, Lives of Scottish Poets.)

LINDSEY, REV. THEOPHILUS, was the youngest son, by a second marriage, of a respected merchant, and pro-

prietor of salt-works, residing at Middleton, in Cheshire, where he was born June 20, 1728, Old Style. His mother having some connection with the family, by whom he was so much respected, as Misses, was the daughter of Lord Belasyse, Baroness of Selina, Countess of Huntingdon, stood god-father for him, and gave him his baptismal name. Lindsey entered St. John's College, Cambridge, in 1741; and, after taking his degrees, he was elected fellow in 1747, about a twenty-third year, he commenced his clerical duties at an episcopal chapel in Spital Square, London. He then became domestic chaplain to Algemren, Duke of Somerset, and after his death, travelled for two years on the continent with his son, subsequently Duke of Northumberland. On his return, about 1755, he was presented to the living of Kirkby Wiske, in the North Riding of Yorkshire; and in 1756 he removed to that of Piddington, in Dunstable, where he lived, and the Prince of Wales, for whose child he was nurse, received additional strength from the commencement of an intimacy with the Rev. William Turner, a presbyterian minister at Wakefield, and Dr. Priestley, then a dissenting minister at Leeds, both of whom he was entertained by. He had a great love of learning, and was a man of excellent judgment, but, for reasons explained at some length by his principal biographer, on his own authority, he did not deem these a sufficient obstacle to the renewal of his assent to them on en-
tering a new life.
for the maintenance of Unitarian worship. His published ‘Apology’ having been attacked in print by Mr. Burgh, an Irish M.P., by Mr. Bingham, an by Dr. Randolph, Lindsey replied to it in 1776. In 1778, he answered the last of these writers. In 1781 he published ‘The Catechist, or an Inquiry into the Doctrine of the Scriptures concerning the only True God, and object of Religious Worship’; in 1783, ‘An Historical Account of the State of the Unitarian Church and Separation from the Reformation to our own times’; with some account of the obstructions it has met with at different periods; an elaborate work, which had been several years in preparation. In 1784, the baptism of Michael Robinson of Cambridge’s Pleas for the Divinity of our Lord Jesus Christ, by a late member of the University. The work to which this was a reply had appeared several years before, by Dr. Priestley, in a form of address to the students of Oxford and Cambridge; and this was followed in 1790 by a ‘Second Address to the Students of Oxford and Cambridge, relating to Jesus Christ, and the origin of the great errors concerning him.’ In 1782 he invited Dr. Dibney, then the left the Establishment Church on the same grounds as he had done himself, to become his colleague in the ministry at Essex Street, and in 1783, on account of age and growing infirmities, he resigned the pastorate of the church based on his objections to a well-drawn up and revised edition, the fourth, of his liturgy. He never continued to reside at the chapel-house, as did his wife after his death. In 1789, he married, with an evangelical preface, the ‘Letters to a Philosophical Unbeliever,’ which Dr. Priestley had recently published in America in reply to Paine’s ‘Age of Reason’; and in 1800 he republished the long and continued the writing of his works, on the knowledge which he had amassed, in such a way that the Hebrews had of a future state. Lindsey’s last work was published in 1802, entitled ‘Conversations on the Divine Government,’ showing that everything is from God, and for good to all.” He died on the 3rd of November, 1808, in his eighty-sixth year, and was buried at Bunhill-fields. Copious biographical notices of Lindsey were published in the ‘Monthly Repository’ and ‘Monthly Magazine’ of December, 1808, the former being by Mrs. Catherine Cappe, with whom he had lived on intimate terms when in Yorkshire, and the latter by Mr. Joyce; and in 1812 the Rev. Thomas Belsham published a thick octavo volume of ‘Memoirs,’ in which he gives a full analysis of his works, and extracts from his correspondence, together with a list of his publications, which embrace, besides those above mentioned, several single sermons and two volumes of his ‘Memoirs’ shortly after his death. The amusing autobiographical ‘Memoirs’ of Mrs. Cappe, published in 1822, also contain many notices of Lindsey. A portrait of him accompanies Belsham’s ‘Memoirs.’

LINEAL DESCENT. [Desmont, P. C.] L’INGEGNO. [Lucio Andrea di, P. C. S.] LIPARI. [Descomoli, P. C. S.] LIPPO, a celebrated Italian painter and one of the most distinguished of the Quattrocentisti, was born at Florence in the year 1412. He was the son of Tommaso Lippi, who died when Lippi was only two years of age; his grandfather’s name was Guido Lippi. His mother died soon after he was born, and he was brought up by his father’s sister Mona Lappipc, until he was eight years old, when she placed him in the Carmelite convent Del Carmine, to commence his education. Here he showed the inclination for study and so great a propensity for scribbling figures and other objects in his books, that the prior came to the wise conclusion of having him educated for a painter, then an occupation in which he had the least inclination; but this was assuaged when he assumed the life of a monastic life. Filippo was accordingly permitted daily to visit Masaccio, who was then employed in painting the chapel of the convent, and he took extreme delight in contemplating the frescoes of St. Peter, which were destroyed; and he worked on other works in various parts of the convent and in the church Del Carmine, each work superior to its preceding, and so like those of Masaccio that his spirit was said to have passed into Filippo. All these works however, or at least what remained of them, were destroyed in the conflagration of the church in 1771.

In 1430, or when only seventeen years of age, Filippo gave up the convent life, and returned to Florence, where he was taught by Andrea del Sarto, and by Simmaco and Donato de' Panni, and to Ancona. Here, while on an excursion of pleasure at sea with some other young men, he was captured by a pirate and carried in chains to Africa, and there sold as a slave. Eighteen years later, in 1448, he escaped and returned to Florence; and one of the first works which he executed at this time was a small picture of the Assumption of the Madonna, for the wife of Cosmo de’ Medici, which is now in the Imperial Gallery at Florence.

Fra Filippo executed many excellent works at Florence, Fiesole, Arezzo, and at Prato. While engaged in 1459 in the convent of Santa Margherita, in the last named place, he met with one of the nuns, carried off Lucrezia, daughter of Francesco Buti, a young Florentine lady who was being educated at the convent; and he had a son by her called Filippino Lippi, who became well known as a celebrated artist. Filippo was dead in 1456, aged only forty-five. The death of San Bevignate, celebrated for the cathedral of Prato, is one of Lippi’s finest works; it is in oil and on panel, and is still in the cathedral. The passages also from the lives of John the Baptist and St. Stephen, painted in fresco, in the choir of the same church, from 1456 to 1464, the figures of which are colossal, are among the best works of the fifteenth century: Vasari terms the martyrdom of St. Stephen his masterpiece. Fra Filippo has introduced his own portrait into this piece, and he has painted that of Lucrezia Buti as Herodias in one of the series from the life of the Baptist. These frescoes were recently restored by a painter of Prato of the name of Marini.

Fra Filippo died at Spoleto in 1469, aged 57; this is not doubt the correct age of Filippo, though Vasari by his carelessness has done much to obscure the matter. In his first edition he states that Filippo died in 1483, aged 67, and in the second, in the same year aged 57; but 1483 is evidently a misprint for 1458; and, from Filippo’s connection as a boy with Masaccio, he cannot have been 67 when he died, but may very well have been 57. The facts mentioned in his Life: the year of his death, however, was 1469, as discovered by Baldinucci in the Necrology of the Carmelites. But Baldinucci and all other writers have overlooked another one of the evidence connected with Masaccio, and have assumed 1400 to be about the time of Filippo’s birth, whereas Masaccio himself was born only in 1402.

The pupilage of Filippo to Masaccio, or his works, is the subject of another fact, hitherto in doubt, namely, the time in which Masaccio executed the frescoes of the Carmine, supposing they were all painted at one period. Vasari says they were painted after Masaccio’s return from Rome, and after the recall from exile of Cosmo de’ Medici, which took place in 1434. But the ‘Consecration of the Church of the Carmine,’ in the cloister, was painted before Filippo left the convent, because Filippo painted his picture of the Consecration of the Church of the Carmine at a Columbus interval by the side of it; and, as said above, he left the convent when only seventeen years old; at the latest, therefore, in 1430, when Masaccio may have been twenty-eight years of age. The frescoes of the Consecration were finished by Filippo himself, and not left unfinished by himself, as some of those as also may have been completed before 1430, as Masaccio died before they were all completed, it is probable that he was engaged in this convent at two distinct periods of his life. Filippo himself was about 30 and Masaccio himself about 45 and some of those also may have been completed before 1430, as Masaccio died before they were all completed, it is probable that he was engaged in this convent at two distinct periods of his life. Filippo himself was about 30 and Masaccio himself about 45.
It may be added that, if the particles of a substance be, by the abstraction of caloric, made to approach still nearer to one another, the attraction of affinity will exceed the force of repulsion; and there will be constituted a solid body, which may be crystallized or not according as the particles approach one another gradually or otherwise: in the former case they may arrange themselves in such positions as to become connected together in one direction by the aces at which the attraction is the greatest; while, if the approach is rapid and is accompanied by agitation, the union of the particles may take place irregularly.

The particles of a liquid are held together with considerable force notwithstanding their freedom of motion, since a small quantity of a liquid has a tendency to take a spherical form when at a distance from any substance for which its particles have greater affinity than for another; this is very evident in mercury, oil, and water, the first of which on being suffered to fall on a table immediately divides itself into globules, and the others take a like form when a small quantity of either is suspended from a pointed extremity of any object.

The dilatations of water and mercury by the application of heat, as well as the remarkable fact that the expansions of water are equal at temperatures which are at equal distances above and below about 39° (Fahrenheit's scale), have been noticed under THERMOMETERS, P. C. But the expansions of any liquid, at different temperatures, for equal increments of caloric, are not equal to one another; and the following table of expansions, in volume, for an increment expressed by 1° (Fahr.), is abridged from that which is given by Dr. Young in his Lectures on Natural Philosophy (vol. ii. pp. 392, 393):

Water (Sp. gr. = 1 at the maximum density).

<table>
<thead>
<tr>
<th>Temperature (°F.)</th>
<th>Expansion (in °F.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 and 34</td>
<td>0.0002</td>
</tr>
<tr>
<td>48 and 30</td>
<td>0.0003</td>
</tr>
<tr>
<td>54</td>
<td>0.0008</td>
</tr>
<tr>
<td>64</td>
<td>0.0010</td>
</tr>
<tr>
<td>74</td>
<td>0.0014</td>
</tr>
<tr>
<td>84</td>
<td>0.0019</td>
</tr>
<tr>
<td>94</td>
<td>0.0022</td>
</tr>
<tr>
<td>104</td>
<td>0.0031</td>
</tr>
<tr>
<td>212</td>
<td>0.0038</td>
</tr>
</tbody>
</table>

Highly rectified spirit of wine (Sp. gr. = 0.825).

<table>
<thead>
<tr>
<th>Temperature (°F.)</th>
<th>Expansion (in °F.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>0.0047</td>
</tr>
<tr>
<td>24</td>
<td>0.0054</td>
</tr>
<tr>
<td>32</td>
<td>0.0062</td>
</tr>
<tr>
<td>40</td>
<td>0.0074</td>
</tr>
<tr>
<td>52</td>
<td>0.0083</td>
</tr>
</tbody>
</table>

Sulphuric acid (Sp. gr. = 1.84). |

<table>
<thead>
<tr>
<th>Temperature (°F.)</th>
<th>Expansion (in °F.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>0.0021</td>
</tr>
<tr>
<td>70</td>
<td>0.0029</td>
</tr>
<tr>
<td>85</td>
<td>0.0037</td>
</tr>
</tbody>
</table>

Muratic acid (Sp. gr. = 1.185).

<table>
<thead>
<tr>
<th>Temperature (°F.)</th>
<th>Expansion (in °F.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>0.0033</td>
</tr>
<tr>
<td>65</td>
<td>0.0048</td>
</tr>
</tbody>
</table>

From the experiments of MM. Dulong and Petit, the mean expansion of mercury, in volume, for 1° (Fahr.) between the temperatures of freezing and boiling water, is expressed by 0.00105; between the freezing-point of water and 397° (Fahr.), by 0.00102; and between the freezing-point of water and the temperature at which mercury boils, by 0.00105.

The expansions are expressed in parts of the original volumes of the liquids; and the corresponding linear expansions, in parts of the length of a column of the liquid, may be obtained with a sufficient approximation to the truth on dividing each of the above numbers by 3.

The phenomena of molecular action in liquids are mentioned under Capillary Attraction, P. C.; and the state of our knowledge on that subject is noticed under Thermometers or Measure-ability, P. C. S. For the specific heat of liquids, or their capacity for caloric, see Specific Heat, P. C. S.

LIS PENDENS. [NOTICE, P. C.]

LITHOGRAPHY. PRESS. In the article Lithography, P. C., a reference was made to Press for an account of the press used in lithographic printing; but this account was accidentally omitted.

The mode of printing on a lithographic stone does not differ very materially from that adopted with copper and steel.
plates. A direct downward pressure, such as is used in typo-
printing, would not produce all the required effects: the action necessary being rather a kind of rolling than a direct pressure.
In the lithographic process, the beginning of this art, the plate was composed of a hollow table for holding the stone, covered with a tynampanum or stretched parchment; the engraved stone was inked by rollers, the paper was laid down on it, and the tynampanum was brushed over it; the paper, and a bar of wood was pressed firmly on the tynampanum; the stone, by the action of the levers, was made to traverse from side to side beneath this bar, so that every part of it in turn experienced the pressure of the bar.
All the parts of the apparatus have since undergone improve-
ment and modification. Messrs. Taylor and Martin's lithographic press has two cast-iron uprights rising from the bed or table; and there is a carriage for containing the stone, which carriage is supported on rollers moving along a mini-
ture railway. The scraper or bar, instead of being pressed down, is governed by a handle, which keeps it closely in contact with the tynampanum. A cylinder, worked by a handle, sets the carriage in motion, and the stone is thus brought in all its parts under the action of the scraper or presser. The different parts of the apparatus are ad-
justed to different requirements of the art by regulating screws.
Other machinists have improved the press in various ways; but the general principle of the apparatus may be inferred from these few details.
LITHORNIS. A fossil bird from the Isle of Sheppey is thus named by Owen.
LITHOPERMUTUM (from λιθος, a stone, and περμυς, a seed; in reference to the hard seeds or nuxa), a genus of plants be-
longing to the natural order Boraginaceae. It has a deeply cut calyx in five segments, a funnel-shaped corolla, with a naked or minutely five-sealed throat. The filaments are very short; the stamens included in the tube. The nuts are smooth or tubercular, stony, and attached by their truncate flat base to the bottom of the calyx.
L. officinale, Gromwell, has an erect much-branched stem, lanceolate acute veined leaves with tubercles and adpressed bristles above, hairy beneath; the throat of the corolla has minute scales within, and is of a pale yellow or greenish yellow colour, with a style, hairy and very hard, three or three ripening in each calyx. They were esteemed in ancient times as an infallible lithonthropite; their virtues in this respect are, however, entirely imaginary. This species is native of the United States and North America. It is found in dry and stony places in Great Britain, but sparingly.
L. purpureo-carolanum has herbaceous stems, the barren ones prostrate and creeping, the others erect. The leaves are lanceolate, acuminate, of a dark green, with crenate margins. The flowers are showy and large, at first red, and afterwards of a bright blue. The nuts are white, highly pol-
ished, and hispid. This species has no scales in the throat of the corolla, but merely five longitudinal downy folds. It is native of middle and south Europe, of the Caucasus in woody mountain places, and of England and Wales in chalky soil.
L. arvensis, Bastard Alkanet, has an erect branched stem, lanceolate leaves rather acute, hairy, and subcordate; the calyx a little shorter than the corolla; the nuts tubercular, wrinkled, polished, and of a pale brown. The throat of the corolla is destitute of scales, as in the former species. The flowers are white or yellow. It grows in clay soil on old walls, and in the banks of waysides. It is an annual plant.
L. officinarum furnishes a drug, the herbaceous short-stemmed, the leafy stems, slender lanceolate leaves, the lower ones oppo-
site; the calyx is shorter than the tube of the corolla, con-
ving when bearing fruit. It is native of Egypt and the island of Cyprus, and has the habit of an annual, being unknown in our temperate zone. It is the Lithocharum or Semifolium of Pliny, 27. c. 74. L. acutissimum is the Derris semiarvensis of Dioscorides, 4. 199.
All the genera of the Lithocharum are noted for the sturdy hardness of their pericarp, which have thebrittleness and taste of porcelain. This membrane when analyzed is found to con-
tain nearly 60 per cent. of earthy matter, which is more than is known in any vegetable body. According to Boner, L. officinale is the only true Lithocharum, none of the other species having a crown of scales in the throat of the corolla. The perennial and herbaceous species are plants of very easy cultivation, and the seeds are easily propagated by seed, which may be sown in the open ground. The annual species should be treated as greenhouse plants, and the shrubby kinds may be grown on rockwork or on wall-
tops, where they will maintain themselves if allowed to scatter their seeds. They do very well in pots among other alpine plants, and cuttings may be rooted under a hand-
glass. In general they are however short-lived and apt to rot.
(Don. Gardner's Dictionary; Birmingham, Manual Bril.
BoL.; Burnett, Outlines of Botany.)
LIVERWORTS, or LICHENS, a family of plants be-
longing to the class Cryptogamia, of which a definition is given under Fungi; there are about sixty genera, which are divided by Fries into four sub-orders—Hymenolitidi, Gasterolitidi, Lichenolitidi, and Conolitidi; to these some systematists add Byzaceae. In Etvans' British Flora of S. J., the Lichens are divided into several tribes, each tribe comprising several genera.
Several species of Lichenese are characterised by having an open disk, and being destitute of an hypothallus. It embraces the genera Usnea, Evernia, Roccella, Ramellia, and Cetraria. Several species of Usnea are known by the common names of Jupiter's beard, Tree-boat, &c. on account of their hair-
like appearance. They are amongst the most common of the Lichenes which cover the trunks of old trees, and give to them a picturesque appearance. U. plicata is a common species on old trees, park palings, &c., and has been recom-
Inged as a remedy in hooping-cough.
The species of the genus Evernia are common in Great Britain. One of these, E. procarnari, has a peculiar power of imbibing and retaining colours, and on this account is in much request as an ingredient in perfumed cushions and sweet pots. It has been recommended as a remedy in vegetable affections. It is frequently found on the oak and other trees. Evelyn says of it, 'This very moss of the oak that is white composes the choicest cypress-powder, which is esteemed a fine badge.' Bennett commonly uses under that name, as they do the fungi for the true agaric (excellent for hemorraghes and fluxes), to the great scandal of physic.' It is said that E. uspinus is poisonous to wolver, hence its name, but little is known of its real properties.
The genus Ramellia is found associated with the last two on the trunks and branches of trees, especially of the fir, the birch, the oak, the maple, and the hawthorn. Lightfoot says that the R. scopulorum 'will dye a red colour, and promises in that intention to rival the famous Lieben roccella or argol which is brought from the Canary Islands.'
For the properties and uses of the species of Roccella and Cetraria see Orchil, P. C., and Cetraria, P. C. S.
The tribe Parmeliaceae is characterised by a horizontal thallus. To it belong the genera Polypersona, Sistea, Borrera, Parmelia, &c.
Two of the species of Peligeria, P. caudina and P. aphthosa, have been used in medicine: the former as a remedy in hydrophobia; the latter is boiled in milk and administered in the thual.
The species of Parmelia are exceedingly numerous; one of the most common throughout Europe is the P. parietina, yellow moss. The thallus and shields are both of a yellow colour; and Lightfoot says, 'It is affirmed to die a good yel-
low or orange colour if mixed with alum.' It has also a very bitter taste, which has caused it to be used as a tonic in medi-
cine, and it has been recommended as a remedy in intermittent fever. It is the plant on which the famous Edward Cudbear. [Parella, P. C.] P. Parella affords the sub-
stance known as Lirutus, or Leucmus. [Lytmus, P. C.]
One of the species of the genus Sistea, S. pulmonacea, has been used as a substitute for the Iceland moss. [Cetraria,
P. C. S.] It is used in Siberia for giving a bitter flavour to bear. It is a native of Great Britain, and is found on the roots of old trees, especially when dying, and on old pales.

The tribe Loc(<i>e</i>)a embraces the important genus <i>Cladonia</i> [C(ladonia), P. C. S.], and also <i>Cpasacco</i> and <i>Sevophoros</i>, which are often among the subgenus of <i>Cladonia</i>. The <i>S. pyrriadiis</i> and <i>S. coccifer</i> are elegant lichens, having their apothecia elevated above the thallus in the form of little cups, those of the latter species being coloured scarlet. They have both been used in medicine as astringent and febrifuge.

The tribe S(<i>p</i>)hakorphenes contains the genera <i>Sphakorphenes</i>, <i>Fuscarea</i>, and <i>Isidium</i>. They are an exceedingly elegant group of lichens, but the species have not been much used for economical purposes. <i>Isidium</i> corollinum is said to be rich in colouring matter.

The genus <i>Kendycarpus</i> and <i>Porina</i> belong to the tribe <i>Kendycarpus</i>. The species of the former genus are found on rocks and stones, whilst those of the latter are interesting as forming distinguishing marks between various kinds of lichens used in medicine. The species of the tribe <i>Heterocarpus</i> have been used to apply a knowledge of the various species of lichens to the distinguishing not only between the bark of different species of <i>Cinnchona</i>, etc., but also between good and bad qualities of the drug.

The principal genus of the tribe <i>Verrucaria</i> is <i>Verrucaria</i>, of which the species are very numerous. [<i>Verrucaria</i>, P. C. S.]

The tribe <i>Graphidales</i> is remarkable for the forms which the apothecia assume, bearing a resemblance to the letters of Eastern alphabets. This may be seen in <i>Ographes</i> scripta in Fig. 7 of the woodcuts illustrating the article <i>Lichens</i>, P. C. As an indication of the value of the lichens in distinguishing the various species of <i>Cinnchona</i> bark, Fée states that the <i>Graphis interrupta</i> is only found on the bark of <i>Cinnchona</i> inoxifolia. Although the study of the lichens on the official barks has not produced all the advantages anticipated by Fée, there can be no doubt of its value in many cases. Referring to this subject, Burnett observes, 'Until the publication of Fée's memoir on the cryptogamic epiphytes of the official barks, the study of the <i>Ographes</i> and their allies seemed to be one rather of speculative amusement than of practical utility. But now the case is wholly changed, since these graphic plants, these living letters, written by Nature's hand, are shown to constitute inscriptions legible by men. Always curious indeed, and admirable even to the least tained eye, did the examination of these mimic characters appear; and as fancy traced the likeness to various Oriental signs, so were these little plants called Scriptura-wroes, some <i>erniarum</i> (apparently Sinegoitys), and so forth. But, like the hieroglyphs of the Egyptian nations, their meaning was buried in obscurity, and so little guessed at, that it often was doubted whether they had ever been recognized by the lichenologists as wiser than wisdom, until the Young and the Champollion of the vegetable world arose, and by means of a natural Rosetta-stone deciphered these letters unknown mean characters, and taught us to 'persue this part of the sacred Scriptures of creation.' (Burnett, <i>Outlines of Botany</i>; Lindley, <i>Natural System</i>; Lindley, <i>Flora Medica</i>; Fries, <i>Lichenographia Europaea</i> re-foct.)

LIVERMEN OF LONDON. [LONDON, P. C. J

LOCK, a kind of secret fastening in which a moveable piece, termed a bolt, may be projected by the action of a separate instrument, called a key, introduced into the lock in such a manner that it cannot be returned to its original position, so as to release the door, cover, or other article to which the lock is applied, excepting by another application of the key. While, however, the above appears to be the distinguishing characteristic of a lock, there are many locks in which the bolt is projected by the action of a spring, without the aid of the key, and in which it may be drawn back upon one side of the bolt to which it is applied by means of a handle, although it cannot be moved from the other side without the application of the key. Many such locks fall under the general denomination of latch or latch-locks. In other locks, again, there are two or more bolts, one of which only is under the control of the key, the others being moved by handles, while in another class of locks two or more bolts are shot or

Fig. 1.

*2 E 2*
Locomotively used, the keys, which are all represented as the pipe or tubular make, being presented to the eye endways. Of the three a, b, and c, are adapted for key-holes of various corresponding forms, while e and f, though suitable for key-holes of the same general form as the bit a, admit of further security by forming projections upon the sides of the key-holes, which rest upon the plate of the lock, to fit the notches and grooves cut in the sides of the bit. The next and principal means of security of the first class mentioned above is the use of pieces of iron or brass of various forms, fixed within the lock in such a way that no key can be turned round within it unless corresponding notches or slots are cut in its projecting bit. Fig. 2, which represents a portion of the interior of a lock in isometrical projection, with the bit end up, shows how the face of the hole, will illustrate this. The tinned surface in this cut represents part of the back-plate of a lock with a tubular key turning upon a central pin in the plate. Attached to this plate are two concentric prominent rings, of different degrees of elevation, one of which, for the sake of variety, is represented as complete or unbroken, while the other is cut away for a small space at the under side. These prominent rings are the wards, or, in technical language, wheels, which impede the introduction of a false key.

It is obvious no neutral key could be put into a lock provided with them as in the cut, unless a slit or notch were made in its bit to correspond with the larger and more prominent of the two rings, and this is equally evident that, although it might be put into the lock, the key could be turned round without having also a notch to correspond with the smaller and less prominent circle, which, being cut off from the key-hole, could not be discovered by an inspection from the outside of the lock. In the commoner kind of locks the wards seldom form a complete circle, but their effect is the same if they occupy only a small segment of it. They are commonly made of thin sheet iron, riveted to the plates of the lock, but locks with similar wards of copper are made for use in cellars, and other places exposed to damp, where iron wards would become rusty. A thicker kind of ward, known as solid wards, formed by casting in brass, and finished in the lathe, is used in many superior locks. The above cut represents wards of the simplest possible shape, which require nothing but a simple straight notch in the key to fit them. Many wards, however, are of a more complicated character, such as what are termed L, T, or Z wards, from the resemblance of their sectional form to those letters respectively. The keys must, of course, be cut of a corresponding form, by which the difficulty of imitation is greatly increased.

By referring to the various forms of key represented in Figs. 3, 4, 5, and 6, the peculiar advantages and defects of that principle of security which depends on the use of wards may be readily comprehended. The first and greatest defect of the system arises from the circumstance that, in ordinary cases, it is not absolutely necessary that a surreptitious instrument should perfectly thread the mazes of the wards. Thus the form and arrangement of the wards in the three keys marked g, h, and i, Fig. 3, is so different, that none opposite plate of the lock, and requiring notches in that part of the bit of the key which is represented by the slender connecting piece in the skeleton. Such is the case in all the keys represented in Figs. 4, 5, and 6. In Fig. 4, 1 represents a key for a solid-warded lock, which might, however, be easily picked by a skeleton key resembling r. The greater complication of the wards in w, Fig. 4, increases the difficulty of picking; while by the adoption of the arrangement shown at m, Fig. 4, the difficulty of introducing a false key is made perhaps as great as possible, since no instrument that does not thread all the intricacies of the wards could answer the purpose. This form, however, requires a very accurate workmanship, and unavoidably weakens the key to such an extent that it is in danger of breaking in the lock. All the keys hitherto represented, as well as those in Fig. 6, are pipe-keys, adapted for such locks as have a fixed pin or ax, and can only be opened from one side. It is, therefore, of no consequence that the wards attached to the back and front plates of the lock should resemble each other. In ordinary door-locks, however, in which the key may have to be inserted from either side, it is essential that the wards attached to the two plates, if such be used, should either be precisely similar, or should bear such a relation to each other that notches may be cut in both sides, or rather edges of the same, or, as it is sometimes called, the sect, of the key to suit both sets of wards, it being a necessary condition that the two sides of the bit, marked a and b in the cut, Fig. 5, should be perfectly alike. In such locks there is, very commonly, an intermediate plate, which enters the opening marked c in the annexed figure, and which carries, on one or both of its sides, the principal wards; and in many cases the bit of a key divided by such an opening may be considered as constituting a double key, of which only one-half is used at one time, that half being either a or b according to the side through which the key is put into the lock. Such is in some measure, the case in the key from which Fig. 5 is drawn; although, as it is the key of a tumbler lock, both halves are brought into use at once, whatever may be the direction in which the key is turned. When, however, the key is applied from the outer side of the door the part marked a moves the tumbler and b the bolt, while when the key is put into the lock from the inner side a moves the bolt and b the tumbler. The combinations of wards are intended to explain the theory of master-keys, which was early understood by the ingenious locksmiths of Wolverhampton. In Fig. 6 the wards of the keys o, p, and q are so far different from each other that neither of these three keys would open the lock designed for either of the other two, but a key formed like r would readily open any of the locks of the other three, or any other of a more extensive series, or suit, of locks constructed on the same principle.

One defect of the principle of security by wards is that, however complicated they may be, an ingenious picker will mostly be able to detect their form and position, by inserting a blank key with the bit covered with wax or tallow, so as to receive an impression of the concealed obstructions in the lock. It is well to observe, however, that it is very common practice to cut more notches in the key than there are wards in the lock, so that the complex appearance of a key is no certain
proof of the secure construction of the lock to which it belongs. Indeed some of the commonest locks are manufactured without wards at all, although the keys are invariably made as if wards were employed.

As above stated, some contrivance is necessary to keep the bolt steadily in the position in which it is left by the key; and in locks which depend upon wards for their security, this is usually effected by means of a spring, as illustrated by Fig. 7, which represents the interior of a small cupboard lock, with the bolt, a b, half shot, or in a position intermediate between locked and unlocked, and could be either backward or forwards by the action of the bit of the key at c in a curved hollow formed in the lower edge of the bolt. The end a of the bolt is divided into two parts, shooting through separate hollows in its lock; the top part of the bolt carries a long elastic piece formed by nearly separating a stout lamina of metal from the body of the bolt, and giving it an inclination to diverge from the bolt at the end b; and the lower edge of the bolt, behind the curved part acted upon by the key, is indented with two deep notches, b and d, with a smooth convexity between them. The opening in the back rim of the lock through which the end b of the bolt passes, is so small as to compress the spring with considerable force. If, therefore, the key be so applied as to shoot the bolt forward, the reaction of the spring will cause the notch b to hold firmly on the edge of the rim, from which it cannot be disengaged without raising the bolt, and compressing the spring, so as to allow the convexity between b and d to pass over the edge of the rim, after which the notch d will hold on the rim in like manner. The necessary raising of the bolt and compression of the spring is properly effected by the action of the key, but as it may be effected by pressure upon the end of the bolt, the security of locks in which such an arrangement is adopted, which are called back-spring locks, is inferior to that of locks in which the next breath of our subject, in the means of retaining the bolt in its position, as well as from the defects already explained as incident to the use of wards.

We pass naturally from the consideration of the back-spring and take up that of the lock, or method of opening it. The second principle of security, which consists in the use of moveable impediments to the motion of the bolt, and which may be applied, as an additional security, to locks in which the most ingenious arrangements of wards is employed to prevent the access of a false key to the bolt. Fig. 8 represents, side by side with our figure of a back-spring lock, a similar lock provided with a common tamper. In this figure the bolt a, b, though shot backwards and forwards in the same manner as that of Fig. 7, has no spring, or notches to catch on the back rim of the lock, to hold it in any required position; but it is provided with two notches in its upper edge, a and d. Behind the bolt is a piece of metal called the tumbler, pivoted to the plate of the lock at f, and continually forced downwards by a spring which presses upon its upper edge. The tumbler, which is visible above the bolt, is distinguished in the cut by being covered with a light tint, while the shape of the lower part, which is concealed by the bolt, is indicated by dotted lines. At the angle a the notch, which is visible above the bolt, is fully shot, falls into the notch d, and holds it firmly until, by the application of the key, the bit of which reaches the lower edge of the tumbler, the tumbler is lifted up to the position shown in the figure, at which position it will remain unless the further turning of the key shoots it back, when the stud of the tumbler falls into the notch c, and again secures the bolt. It is obvious that so long as the tumbler remains in its proper position, the bolt can neither move backwards nor forwards by the pressure upon its ends; and also that the lock cannot be opened by any pick or false key unless its bit be so formed as to reach the tumbler as well as the bolt. To render this more difficult, the tumbler is placed on the back of the bolt, so as to be acted upon by a step formed on the bit of the key; while further complication and security may be obtained by the use of two or more tumblers, which may be acted upon by different parts of the key. The necessity requisite in the length of the bit forms a strong recommendation of even the commonest tumbler locks; for if the bit be ever so little too short it will not lift the tumbler out of the bolt, and if too long it will not enter the curved portion of the bolt.

According to Mr. Ainger, the principle of security by tumblers, though of comparatively modern application in this country, has been known to the Egyptians in a very primitive period. In the lock now commonly used in Egypt and Turkey, the bolt is secured by a number of pins, which, though contained at other times in holes or sockets in a solid piece through which the bolt slides, fall into holes in the bolt when it is shot. This contrivance is illustrated by the annexed diagram, Fig. 9, in which a is a part of the bolt, capable of sliding through the solid piece b, in which are a number of hollows, c, c, c, each containing a moveable pin. As it is only by a sectional diagram that these pins can be represented, they are drawn as if all were in one straight line, which, however, is not the case in practice. In the present position of the bolt the pins rest upon its upper surface, and offer no impediment to its motion; but if the bolt be slid forward until the holes, d, d, come under the pins c, c, c, the lower ends of the pins will drop into them, and the bolt will consequently be held fast. It can only be released by the application of a kind of key which has a series of fixed pins exactly corresponding with the holes in the bolt, and which, being introduced into the bolt by the hollow or cavity e, is pressed upwards in such a way as to lift the pins clear of the bolt. The security arises from the concealment of the obstacles to the motion of the bolt, and from the circumstance that, supposing a person to obtain a correct impression of the holes, it would be difficult to ascertain the exact length necessary for the pins of the key. If too short they would not raise the pins clear of the bolt, and if too long they would enter the holes in the solid part above the bolt, and so impede its motion. This kind of lock, Mr. Ainger observes in the 'Encyclopaedia Britannica,' appears to be extensively, or rather universally, employed, for gates of towns and palaces, and houses, as well as for the smallest articles of furniture. The evidence of its alleged antiquity is derived, he adds, according to M. Denon (in whose magnificent work on Egypt it was published), from the circumstance of finding one of the bas-reliefs which decorate the great temple at Karnak, from which also it was ascertained that during forty centuries the lock had undergone no sensible change.'

Notwithstanding the high antiquity of the tumbler principle, its first important application in this country appears to have been made by Barron, in 1774, according to most of the authorities, or if not, section to the 'Encyclopaedia Britannica.' In the simple form of the tumbler represented in Fig. 8, there is the disadvantage that, while it effectually prevents the removal of the bolt unless the tumbler be raised high enough, it presents no obstacle to its removal when, by the use of a false key, the tumbler is thrown up beyond the proper degree. This defect is remedied in Barron's lock, and in many more recent contrivances with which we shall deal upon it, by the use of several tumblers, each of which requires to be raised to a different degree, and any one of which, if lifted too high, will form as effectual a barrier to the motion of the bolt as if it was not lifted at all. To illustrate this, let a, Fig. 10, represent a tumbler pivoted at b, pressed downwards by the action of a spring, not shown in the cut, at c, but
is raised precisely to such a degree as to bring the horizontal portion of the H-shaped aperture opposite to the stud, so that the stud, which fits it accurately, may slip through it. Fig. 11 shows the tumbler raised to this position, and the bolt half shot. When fully shot the tumblers are raised and the stud is seated in the division notch of the H-shaped aperture which lies nearest the end of the tumbler; and an equal security is afforded against any attempt to return it to its first position by any key which does not fit the proper height. Several such tumblers may be placed in one lock, the whole being mounted upon one pivot; and if the horizontal connecting portion of the H-shaped aperture be placed at a different elevation in each, each will require to be raised to a different degree to allow the stud of the bolt to pass. These different degrees of motion are provided for by variations in the curved portion of the lower edge of the tumblers, against which the bit of the key acts, and by dividing the end of the bit into a series of steps and notches, each acting upon a single tumbler.

Chubb's detector lock, the original patent for which was obtained in 1818, though an important improvement upon it was secured by a second patent in 1824, is one of the most celebrated locks made on the principle above described. Its peculiar merit consists in the addition of a lever, called the detector, which is so fixed that, while it does not affect the bolt at all under ordinary circumstances, it cannot fail to move so as to drop a catch into the bolt if any one of the tumblers be lifted a little too high, as some of them must inevitably be by any attempt at picking the lock. By thus fixing the bolt immovably, it not only renders useless any further attempt at picking the lock, but also gives notice of the attempt which has been made, when the proper key is next applied. By very ingenious contrivance the proper key is enabled, after lifting all the tumblers to the proper degree for shooting the bolt, to release the detector by a peculiar movement, and thus to restore the lock to its usual state.

In Bramah's lock, which was invented and patented about 1784, the principle of tumblers or moveable obstacles is applied in a very different manner to that above described, and the use of wards is entirely abandoned. In a kind of presatory record which was attached to his specification, and is quoted by Holland, Bramah alludes to the insufficiency, for the purpose of security, of all contrivances of the ward, or fixed obstacle character, not only on the grounds above noticed, but also because, according to Holland's abstract of his argument: 'the variations capable of being made in the disposition of such wheels or wards, and in the form of the key's bit, are not sufficient to produce the required number of locks, without having large quantities exactly alike, and their keys capable of opening one another reciprocally; in consequence of which they become a very imperfect security against violation, as any ill-disposed person might, by furnishing himself with a number of old keys, be enabled to open almost all the common locks in the kingdom with as little difficulty as if he had in his possession the key belonging to each lock.' In devising a remedy for these defects, Bramah contrived a method of supplying a more effective protection in a very different manner, as shown in Fig. 13, which is the common locks in the kingdom with as little difficulty as if he had in his possession the key belonging to each lock.' In devising a remedy for these defects, Bramah contrived a method of supplying a more effective protection in a very different manner, as shown in Fig. 13, which is the
further edge of each of these sliders, however, is cut a notch of such size and depth, that if it be brought to the same level as the bar b b, the bar will be capable of sliding through it. These notches in the sliders, shown by 1, 2, 5, and 4 in the diagram, are cut at various degrees of elevation, so that, in order to bring them all to tally with the bar at once, it is necessary to enable it to slide through them, each slider must be lifted up to a certain degree, different from the elevation of either of the others. As, however, the lower ends of the sliders, which pass through the bottom of the frame a, a, and which are the only parts of the apparatus intended to be visible, have a uniform degree of projection, it is impossible to tell how high they must be lifted in order to make its notch tally with the bar; and this can only be done by the application of an instrument resembling that marked g in the figure, in which are a series of slits, d, e, f, and g, corresponding with, and capable of fitting on to the lower ends of the sliders e, d, e, and f, and each slit being cut to exactly such a depth that when the instrument, or key, is put upon the ends of the sliders, and pushed up until its lower end comes in contact with the bottom of the frame, its corresponding slider will be raised to the degree necessary to make its notch tally with the bar b b. While the key, g, is held in this position, the bar b b may be slid backwards or forwards; but the instrument in its original position, and the key is withdrawn, the sliders fall, by their own weight, into the position represented in the cut, and the bar is again held fast.

In order to explain how the principle of security illustrated by the above intrinsic contrivance is applied in Brahah's lock, we must premise that the ordinary mode of depressing the key, in the action of the bit of the key, is entirely abandoned in it; the office of the end of the bit being performed by a stud attached to the end of a cylindrical barrel which is mounted in the lock, and which contains all its essential parts; or, rather, all the parts essential to its security. Fig. 14 represents this barrel, of the actual size, drawn from a street-door latch-look, the central figure being a side view of the barrel, and the others representing its back and front ends. The circle at a, in the side and back views, represents the stud by which, when the barrel is caused to revolve on its axis, the bolt is moved as by the bit of an ordinary key. This revolving motion is imparted to the barrel by the insertion of the proper key, which is represented in Fig. 17, and which has a very small bit adapted to the square notch at the back of the head of the front end of the barrel; but the barrel is prevented from revolving by the stud shown in Fig. 15, but arranged, for convenience, in a circular form within the barrel. In this modification of the apparatus, the barrel, which contains four sliders radiating from its centre or axis, and having a motion in the direction of its length, represents the frame with its series of vertical sliders; the sliders, instead of being kept in their ordinary position by gravity, are continually pressed forward to the front or key-hole end of the barrel by a helical spring; and the bar b b is represented by a circular plate of steel, represented of the actual size in Fig. 15, which is cut in two halves by a division shown in the cut at top and bottom, and is inserted, by its inner edge, in the slit or opening b b in the barrel, Fig. 14. The four notches in the inner edge of the plate are thus placed upon the edges of the four sliders in the barrel; and as the plate is screwed by a nut shown in Fig. 15 at its two sides to an immoveable part of the lock, it follows that the barrel cannot be turned round unless the four sliders are so far pushed forward that their notches may all tally with the edge of the plate, Fig. 15. Fig. 15 is a longitudinal section of the barrel with the end of the key as applied to bring the sliders into the required position for allowing the barrel to turn; and Fig. 17 represents, at a in profile, and at b an end view, the key itself separately. The key, being tubular, is put upon the fixed central pin or axis, shown in Fig. 16, the four radiating notches in the end of its pipe fitting, at the same time, on to the ends of the four sliders, which are shown in Fig. 14. These sliders, two of which are shown white in the section, Fig. 16, are, in the absence of the key, kept pressed against the front of the barrel by means of a collar which slides upon the central pin or axis, and is pushed forward by a helical spring which surrounds the pin, and abuts upon the back plate of the barrel; but when the key is pushed into the lock it is in contact with the sliding collar, compresses the spring, and allows each slider to be pushed forward to a degree exactly proportionate to the depth of that notch in the key which acts upon it. By this means the deepest of the three notches represented in the side edge of each slider is brought to tally with the edge of the circular plate, which is represented detached in Fig. 15, and shown edgeways, at b b in Fig. 16, and thus all impediment to the rotation of the barrel is removed, and consequently, by moving the key, the barrel, with its stud a, may be caused to revolve, and to shoot the bolt just as an ordinary key would do. When the barrel is returned to its original position, the key is withdrawn, and the action of the spring restores the sliders to their original situation, in which they lock into the notches of the circular steel-plate, and keep the barrel stationary.

In order to render the above description as simple as possible, we have omitted in it several minor points which tend to the security and efficiency of the lock. The whole of the apparatus above explained is securely enclosed in a turned brass box, so that even the ends of the sliders are only visible at the farther extremity of the deep and narrow section, the centre of which is occupied by the end of the pin or axis, which, projecting considerably beyond the sliders, greatly increases the difficulty of bringing any false instrument to act upon them. The end of the key, the main use of which is to cause the barrel to revolve whenever the key is turned, forms also a stop to prevent it from being pushed in too far, and to indicate when the sliders are brought to the proper position. To prevent the sliders from sliding too far, or from dropping too far into the barrel, in advance of the key, when by the compression of the helical spring they are released from its influence, they are made of a thin piece of metal doubled, as shown at c, Fig. 17, so that their inner ends, having an inclination to spring open, press with sufficient force against the sides of the grooves in which they slide to keep them in whatever position the pressure of the key may place them, until such pressure is withdrawn, and they are exposed to the counter-pressure of the helical spring. The portability of the key constitutes a great advantage of this kind of lock, as a key which may always be carried in the waistcoat pocket, or even enclosed to a watch-chain, is least likely to be mislaid, or to fall into the hands of improper persons, than a large key. Again, both locks and keys, being made almost wholly by machinery, may be made with great accuracy at a moderate cost, when the production of a false key from an impression of the true key, or even from the key itself, would be no easy task to a person not possessed of the requisite machinery. The two additional small notches represented in the tumblers of Fig. 16 and 17, to which allusion has just been made, add greatly to the security of this kind of lock. For some time after its introduction it was deemed absolutely inviolable, but ingenuity at length overcame the difficulty of picking it. This was accomplished by what is termed the tentation, or trying, process. Force being applied to the barrel in such a way as to give it an inclination to revolve on its axis, the picker tried all the sliders in succession,
to ascertain which of them, by the inevitable inaccuracy of workmanship, pressed with most force against the circular locking-plate. This slider he then gently pushed until, by the play of its own perpendicular, the center of the lock being secured in the required position, when, having secured it, he proceeded to adopt the same course with each of the other sliders in succession. Thus, by an extraordinary exertion of his strength, and the dexterity of his hands, the lock-keeper was able, in many instances, to accomplish the apparently impossible feat of picking a Bramah lock. No sooner, however, was this fact made public, than an efficient remedy was provided. This was a device, named Russell's establishment, by the simple device of cutting one, two, or more additional or false notches on each slider, and enlarging, as shown in Fig. 15, the inner portion of each notch. This renders it utterly impossible for a picker to know whether he gets the true notch, or one of the false notches, on the edge of the locking-plate, while, supposing him, against all probability, to find the right notch in a majority of the sliders, the fact of one only hanging on a false notch would be sufficient to prevent the barred from turning, owing to the depth of such notch being insufficient to clear the plate. The enlargement of the notches in the locking-plate, which allows of a degree of motion far exceeding any which could arise from mere inaccuracy of workmanship, adds to the baffling effect of the false notches, by the use of which the Bramah lock may be fearlessly said to be rendered, so far as it is practicable, absolutely safe from picking. The same principle of picking, and the same kind of expedient for security against it, with variations of detail which need not be noticed here, have been applied to turning a true key and a false key into the possession of one picker.

The infinite variety attainable in the manufacture of locks on this principle forms one of its great recommendations. Our illustrations refer to one of its simplest forms, in which only four keys are used, but even in this form the variety attainable, without any difference in the size of the key or the diameter of the central pin, is very great. By the use, however, of five, six, or seven sliders, the number of different locks, each of which may have the same external appearance, but can be opened only by its own proper key, is increased almost to infinity. Bramah himself showed that if twelve sliders were employed and number of changes which might be produced by simply varying their relative positions, would amount to 479,001,500; while adding one more slider the number would be increased to 6,227,019,500; so that, as he observes, 'one lock, consisting of thirteen of the above-mentioned levers, sliders, or other moveable parts may (by changing their places only, without any difference in motion or size,) be made to require the same immense number of keys to open it; and, it is observed that in this case the lock is lost, or the owner desiring, on any account, to have a lock altered, it is possible to change the relative positions of the sliders, so as to render the old key useless; and also that many locks are made, if requiring to be constructed in a new set, or set of locks alike in everything but the position of their notches, and then applying to each of them in succession the intended master-key, which must have notches different to any of the ordinary keys, and cutting new additional notches in the sliders to suit it. Such, indeed, is the principle upon which the notches of ordinary Bramah locks are cut, the key not being fitted to the lock, but made first, and having its notches cut by a machine which provides for a continual change in their order and depth. This done, each key is applied to a separate lock, with blank or uncut sliders, and the notches in the sliders are cut while they are thus held in the proper relative position to the key. By any arrangement would be almost impossible to secure the requisite accuracy.

Owing to the very small size of the protecting apparatus, the Bramah lock has been applied to many ingenious purposes—to which kinds of locks can be made, suitable, among which we may notice the locking of liquor-cocks. Mr. Russell's contrivance for this purpose is referred to under C. P. C. 3. 885, and we see no reason why, for small cock, a note of the present contrivance may not be adopted, in which the revolving barrel of the lock should be attached to, and indeed form the upper part of, the revolving plug of the cock itself, so that a single motion of the hand should be sufficient to open and to open the arrangement would have this advantage, that it would be impossible, by inadvertence, to leave the cock unlocked, since the act of turning off the liquor would both lock it and, by the force of the spring, so far eject the key that it could only be looted the lock by design. In the forty-eighth volume of the 'Transactions' of the Society of Arts (part. i. p. 182) is a paper by Mr. S. Mordan, who has gained much celebrity by the many improvements he has made on this apparatus, on a curious application of this invention to what he calls a "lock-protector," which is, in fact, a scuttle, or shield, adapted to cover the key-hole of a room door, and barring in the key. This scuttle is attached to the door by a lever, the protecting this scuttle to a key-hole on the outside of a door, and turning its key a quarter round, two lanced-shaped pieces of steel are projected from a little box at the back of the scuttle, which is inserted in the door, and which enter the opposite sides of the key-hole, and to hold the scuttle so firmly in its place that nothing short of the application of violence can remove it, until, by a fresh application of the little key, the shield is thrown open. The benefit of such contrivance is to enable travellers at innns to prevent their chamber doors from being opened in their absence, by closing up the key-hole.

A lock was invented by Mr. Kemp, of Cork, in 1816, in which the peculiarities of both Barron's and Bramah's locks are combined in such a way as to afford, in the inventor's opinion, greater security than can be attained by either alone. In this lock, which he calls the union lock, a number of pins or sliders, which detain the bolt much in the same way as the sliders of Bramah's lock detain the locking-plate, are acted upon by the ends of a series of tubes, of various lengths, which are inserted in the hollow of the key. In this way, the key must necessarily be placed in the possession of the key. This kind of key, its inventor justly pleads, must be far more difficult to imitate than either Barron's and Bramah's, so that it affords greater security against any attempt to produce another like it. Mr. Robert, of Hebert, in noticing this invention, observes, that until a complete remedy is provided against the possibility of copying or imitating keys, the art of lock-making is imperfect, and no locks are secure, and he adds, 'a key must be in his possession a lock the key of which cannot be copied—a locksmith possessing no tools by which an exactly similar one can be made.' The machine by which the original one was made, he adds, is so precisely made as to be destroyed in producing another like it. The lock is very simple and strong, and, he says, be manufactured cheaply; but as the inventor was waiting for an opportunity of bringing it before the public, Hebert gives no account of its construction.

As a means of security somewhat differing from any of the above, and affording certain advantages peculiar to itself, we may here notice the permutation or combination principle, of which the simplest application is in a kind of padlock often termed a puzzle-lock, which opens without a key, but is regarded rather as an ingenious toy than as an available substitute for a padlock. The simplest form of a key being turned, with the intention of opening a padlock, with the intention of opening a padlock, is one of the most common forms of locks a bar, with square or other projections from one or more of its sides, is slipped through a series of circular plates or discs, each of which is capable of being turned, and the ordinals of the holes through the centres of these circular plates, discs, or rings, are fitted in such a manner that unless the whole of them are turned round to the extent position which they occupied when the bar was slipped in, it cannot be withdrawn. To provide for bringing the rings to this position after they have been disturbed from it, the periphery of each is marked with a series of letters or numbers, a certain predetermination of combination of which, should be known only to the possessor of the lock, must be brought into a straight line by turning the several rings round with the thumb and finger. As the number of combinations which may be effected, like the number of changes in the arrangement of the letters or numbers in the above-mentioned padlock, is almost infinite, while only one combination will enable a person to open the lock, a high degree of security may thus be attained. The essential defect of this arrangement is, that the secret of the lock must be known to the person who made it, and is liable to become known to persons from whom it is desirable to secure the lock. The Marquis of Worcester, in whose Century of Inventions' second edition, a great number of locks are described, in which the most marvellous properties, are enumerated, would appear, from the seventy-second article in the Century, to have devised an improvement upon this apparatus, as he refers to it in an abstract as an escape. The properties of which he describes as being that the owner, though a woman, may, with her delicate hand, vary the ways of coming to open the lock ten millions of times beyond the knowledge of the smith that made it, or of me who
Invented.' The details of this invention are not given, but in the third volume of the 'Transactions' of the Society of Arts, 1794, the description and representation of an escutcheon of similar character, invented by N. Marshall, and rewarded by the Society in 1781, in which the escutcheon or door by which the key-hole is closed is held by a pin passing through a small aperture in the escutcheon, and those used in the common letter or puzzle padlock, but with this important difference, that instead of the rings or plates being formed each of a solid piece, it consists of an inner and outer ring; the inner one, which contains the notches for allowing the bar to pass through, being so mounted within the outer one, which has the letters or numbers on its periphery, that it may be turned with the key, in order to any required position, or pleasure. The result is, that the relative positions of the internal notches, and the external letters which serve as an index of their situation, may be varied almost indefinitely; and thus, whenever the owner suspects that the secret is known to any improper person, he can vary the combination of letters by which the opening is determined. The details of this ingenious contrivance are fully given in the volume above referred to. In the thirty-eighth volume of the 'Transactions' of the Society of Arts, pp. 221-230, is a minute account of a lock invented by Mr. Angier, in which, in addition to other ingenious features, is an application of the principle of permutation or set combination, the means of not only rendering the initiation of the key all but impossible, but also of so throwing the key itself out of order, that there would be 121 chances to one against a stranger being able to unlock it. In Gottlieb's lock, referred to in the last section of this article, the lock is turned by a key with two bits, and requiring eight or nine distinct movements in the act of unlocking, is used with a double lock capable of shooting two distinct bolts. In Mr. Law- son's lock, referred to in the same section of this article, the key, by which it is stated, the key-hole is so perfectly closed during the act of unlocking, that it would be impossible to move the bolt while a piece remains in the aperture. In Gottlieb's lock, the key is so placed that no key can be put in without perforating it, and that it cannot be removed except by application of the secret key; and to prevent the danger of substituting a fresh paper, its inventor proposed to use paper covered with a device, and torn from a cheque-book which would serve as a tally. In 1831 a patent was obtained by Mr. Rutherford, of Jedburgh, for the construction of a stop-lock or bolt of lock in such a manner that it should be impossible to open the lock with its own key until, by the action of clockwork within or connected with the lock, the stop-plate should be brought into a certain position. By this contrivance a person locking up a bank-safe, cash-box, or a package intended to be sent to a distance, may so arrange the lock that it cannot be opened until the expiration of a certain number of hours. Many contrivances have been effected for attaching an alarm to locks, by which the introduction of a false key should ring a bell or fire a pistol. A good alarm-lock, acting upon a bell enclosed within the case or box of the lock itself, invented by Mr. Michaud, is described in the Society's 'Transactions,' vol. ii. part i. pp. 128-130.

The compound locks used for the doors of iron safes, and for similar purposes, though ponderous and complicated in their appearance, yet in reality, can be made with a key that may be used with a screw by which all the parts of the key are kept firmly in their place. The uppermost or division of the key, which is not numbered, is that intended to shoot the bolt, and must always be placed nearest the end of the key; but the others, marked 1, 2, 3, 4, and 5, may be varied in position at pleasure, so as to correspond with similar changes in the position of the tumblers, or so as to unfit the key for opening the lock. It may thus be ordinarily kept in such a state as to be quite useless to any but the owner, who knows the order of numbers necessary to set it right. Somewhat akin to this class of contrivance is the ingenious secret lock invented by Mr. Friend, and described in the forty-third volume of the Society's 'Transactions,' pp. 114-118, in which it is impossible to open the lock even with the proper key, without the application, at the same time, of an apparatus which is called the guide, and which is so portable that it may be put into a pocket-book. As the action of the guide depends on the permutation principle, even it will not enable a person unacquainted with the numerical order in which it is set, and which may be varied as often as necessary, to open the lock.

In some locks increased complexity, though it may be doubted whether any practical advantage in increased security, is obtained by it, and the danger is certainly, of destroying both comfort and convenience. In one of these locks the contrivances for moving draw-lock and other bolts by means of fixed handles we have said nothing, as these are matters readily understood by an inspection of any common door-lock, and are not essentially connected with the principles of

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too much matters of detail to be given here; and Holland gives an engraving of a lock invented by one of the ingenious Smiths of the day, 1600, of which the operation is by a knob or handle which raises an ordinary tumbler, which, however, can only be lifted by previously bringing a series of other tumblers into such a position that a notch cut in all their edges shall be brought over a series of cut notches in the bolt tumbler. The most noticeable feature of this contrivance is, that while the motion of the bit of the key, and consequently that of the series of tumblers upon which it acts, is not greater than that of the edges of set tumblers upon which the notch is cut are capable of moving through a large arc, thus affording the opportunity for cutting a great number of serrations, or the tumblers above mentioned, to baffle any attempt at picking by the tentative process.

Of some other curious inventions for additional security we can only give a passing notice. Some locks have been made in which the action depends on the key being a powerful magnet. In others the difficulty of opening is increased by requiring a peculiar method of applying the key; but in addition to the circumstance that the secret must be known to several persons, these contrivances suffer from being very inconvenient in use. As a mere mechanical curiosity we may refer to one, contrived by Mr. Thomas Arkwright, and described in the eighteenth volume of the Society's 'Transactions' of 1785. In this invention, a key with two bits, and requiring eight or nine distinct movements in the act of unlocking, is used with a double lock capable of shooting two distinct bolts. In Mr. Lawson's lock, referred to in the same section of this article, the key, by which it is stated, the key-hole is so perfectly closed during the act of unlocking, that it would be impossible to move the bolt while a piece remains in the aperture. In Gottlieb's lock, the key is so placed that no key can be put in without perforating it, and that it cannot be removed except by application of the secret key; and to prevent the danger of substituting a fresh paper, its inventor proposed to use paper covered with a device, and torn from a cheque-book which would serve as a tally. In 1831 a patent was obtained by Mr. Rutherford, of Jedburgh, for the construction of a stop-lock or bolt of lock in such a manner that it should be impossible to open the lock with its own key until, by the action of clockwork within or connected with the lock, the stop-plate should be brought into a certain position. By this contrivance a person locking up a bank-safe, cash-box, or a package intended to be sent to a distance, may so arrange the lock that it cannot be opened until the expiration of a certain number of hours. Many contrivances have been effected for attaching an alarm to locks, by which the introduction of a false key should ring a bell or fire a pistol. A good alarm-lock, acting upon a bell enclosed within the case or box of the lock itself, invented by Mr. Michaud, is described in the Society's 'Transactions,' vol. ii. part i. pp. 128-130.

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security. It is a defect of ordinary draw-back locks that occasionally, from want of oil, from the bevelled end of the bolt becoming rusty, or from some other cause, they will not close without slamming the door violently, and are liable not to act at all, unless they be held open. The latter may be, in addition to the ordinary door-lock, consisting of an internal catch which detains the bolt when it is drawn back, but out is released the instant the door is thoroughly closed, by the pressure of a small projecting catch, or chok, or jamb, by the door-frame itself. All these details are fully given in the Society's 'Transactions,' vol. xix. pp. 290-535.

The second invention referred to is Chubb's combination latch, which combines the simple lifting action of the ordinary French latch, or that which opens with a handle inside the door, and with a key from without, with much of the security of a tumbler lock. In it two, three, four, or more distinct latches are mounted, like a series of tumblers, upon one axis, and made to shut into or behind a double catch, in such a way that they can only be disengaged from it by being all of them raised at once to one exact height, by an arrangement similar to that by which a series of tumblers are raised.

LOCUST (the Gryllus migratorius of Linnaeus, Locusta migratoria of modern entomologists), a well-known insect, belonging to the order Orthoptera and family Locustidae. Locusts are abundant in parts of the western United States, desert lying, and, being gregarious, are thus enabled to perform great devastation, so that when a swarm has destroyed the vegetation of one district, they are enabled to take another, though at a considerable distance. The migratory locust has coexisted in a great variety of animals and people. The pestilential carcase of the dead animal scare the Arians of Nigeria, its leaves are so destructive, whilst the putrid carcases of his dead animal infest the air. The Arabs and people of Nigeria use these insects as food. For full details of the habits, &c. of the Locusts, see Kirby and Spence, Introduction to Entomology.

LOGGE, THOMAS. is supposed to have been born about the year 1556. He was entered at Trinity College, Oxford, in 1573, took a degree, and then, going to London, became an actor and player. About 1580, in an answer to Gosson's 'School of Abuse,' he wrote a 'Defence of Stage-plays,' which was suppressed by authority, and is now one of the rarest of English books, only two copies being known. Another work of Lodge, his 'Afarun against Auarers,' which takes up incidentally the defence of the stage, was printed in 1596. Ten years later he was a student in Lincoln's Inn. Afterwards, it has been conjectured, he became a soldier; and it is known that, in some capacity or other, he accompanied the expeditions of Clerke and Cavendish. According to the information commonly received from the historians of our early literature, this fiery soldier went through yet another change; for he is usually identified with a Doctor Lodge, who obtained the degree in medicine at St. Andrews in 1593 'A Tisclsie on the Plague,' and in 1616 obtained a passport from the Privy Council to 'travel into the Archduke's country,' and recover debts owing to him. Lodge is believed to have died of the plague in 1625.

He was a voluminous and versatile writer. He translated Josephus and Seneca ('The Works of Josephus,' London, 1602, fol.; 'Seneca's Works, both Moral and Natural,' London, 1614, fol.); he wrote several novels, volumes of verses, and miscellaneous pamphlets; and he was a distinguished contributor to the drama in the years immediately preceding the appearance of Shakespeare. His extant dramatic works are two: 1. 'The Wounds of Civil War, lively set forth in the True Tragedies of Marius and Sylla,' 1594, 4to., reprinted in the last edition of Dodson's 'Old Plays,' vol. viii.; a stately historical play, with some eloquence, much action, and little interest either of character or incident. 2. 'A Looking Glass for London and Englands;' made by Thomas Lodge, Gent., and Robert Greene, in Arisbus Majoris,' 1597, 4to., a whimsical but animated dramatic picture, allied to the absurdities of the authorities of Greene.

But Lodge's own exertions as a dramatist, although they entitle his name to a place beside those of Greene and Peele, are not so high as the least of the last; one of these works furnished to a greater than himself. One of his novels is entitled 'Roselynde: Euphues Golden Legacie; found after his death in his cell at Silexdes. Bequeathed to Philip II. Sonnes, noured up with their Father in England. Fetch from the Canaries; 3. 1590, 1592, 1620, 1623, 1642, 4to.; reprinted in Mr. Collier's 'Shakespeare's Library,' 1640. From the above incidents (indeed many also of the minor ones), the grouping of the characters, and many of the strokes of portraiture, for which Greene is so famous, are evident. As Lodge's works exhibit a deeper effort, and his sentiments are more tender, his characters more personable, his scenes more picturesque, both in its prosaic descriptions and narratives, and in the interpolated verses.

LOGGINGS, THE LAW OF, differs according to the custom which regulates each particular case from the general rules of law between landlord and tenant. [TENANT and LANDLORD, P. C.]

As the length of the term for which lodgings are let seldom exceeds or even extends to a year, it is rarely the case that a six months' notice to quit is necessary to be given by the party wishing to determine the tenancy. This can only happen when it is clearly understood that the tenancy is from year to year. But if the taking be for less than a year, as for a quarter, a month, or a week, which may be presumed from the rent being paid at the lapse of those terms, or other circumstances, the length of notice will be regulated accordingly, and the notice of the landlord to quit must be given in the same manner as the notice of the tenancy being that of the term. Unless the lodger gives up possession paying the rent for a whole term in advance, notice of the tenancy will not be released from such a necessity merely from an approbation of the landlord, however just, of his goods being detained for his landlord's rent.

A contract to let lodgings being a contract for land under the interpretation of the Statute of Frauds, unless such contract be in writing an act for sale and occupation cannot be maintained against the party refusing to enter.

Lodgers are entitled without special contract to the use of such things as, though situated in another house of the house, are necessary to their convenience, as the knocker, door-bell, skylight, &c.

It has been held that a covenant by the leasee not to underlet, is not broken by taking in a lodger, and on this ground may be rested the right of the original landlord to enter and distrain the goods and chattels of the lodger for arrears of rent due from the leasee, it being considered that the occupation of the lodger is that of the leasee. The lodger however can resort to his right to recover against the leasee for the loss so incurred.

The 7 & 8 Ge. IV. c. 29, § 45, protects the property of those who belong to the district of the leasee by making it felony for the person in occupation to steal or appropriate any chattel or fixture allowed to be used in any house or lodging.

(Discussion relating to this subject see Woodfall, Landlord and Tenant; and Coote, Landlord and Tenant.)

LOGAN, JOHN, was born at Fain, in the county of Edin-burgh, to a religious, though poor, parentage, son of a small farmer, and, being destined to the clerical profession, was educated at the University of Edinburgh; after which he became tutor to the late Sir John Sinclair. In 1773, almost immediately on being licensed as a preacher in the Established Church of Scotland, he was appointed to be one of the ministers of the town of Leith. In 1770 he had edited the posthumous poems of his friend Michael Bruce, incorporating with them some pieces which he claimed (and probably justly) as his own, and among which was the well-known Ode to the Cuckoo. His poetical talents were further shown by several pieces of sacred poetry, some of which are inserted in the collection of hymns and paraphrases of Scripture annexed to the psalms of the Scottish church. In 1779, patronized by Blair, Robertson, and other literary men, he delivered in Edinburgh a course of Lectures on the Philosophy of History; the reputation of which justified him next year in his attempt to introduce unsuccessfully, to the Professors of Universal History in the University. Outlines of a part of his lectures were published under the title of 'Elements of the Philosophy of History, Part I.,' 1781. In the same year he was appointed to be a professor of Law on the Government, Manners, and Spirit of Asia." and a volume of Poems, which reached a second edition before the year 1786. He was closely connected with the last of the house of Logan, one of the last of a long line of men of such a name, all of whom were musicians, some of whom were successful in the law, and one of whom was a man of much eloquence, and a highly popular preacher. But his poetical endowments, strongly
lyrical in their tendency, were the highest he possessed; and unfortunately he was tempted to apply these in a path where he was ill calculated to shine, and for the adoption of which proved fatal not only to his professional usefulness, but to his happiness. In 1783 he prised and caused to be acted in Edinburgh a tragedy called 'Rumamade,' which had been represented at Covent Garden; and afterwards published in the English Review, and written by the Lord Chamberlain. This publication brought upon him the anger of his Presbyterian associates; and these and other annoyances, aggravated by an hereditary tendency to hypochondria, from him, in 1785, he quitted his parochial charge and repaired to London. There, retaining by agreement a part of his clerical income, he eked out his living by literary labour, writing papers for the English Review, &c. He was one of the principal Charges against Mr. Hastings, which brought on Mr. Stockdale, the publisher, a prosecution for breach of privilege; the other was a useful summary, entitled 'A View of Ancient History, including The Progress of Literature and the Fine Arts, by William Rutherford, D.D., Master of the Academy at Uxbridge,' 2 vols. 8vo. He died in London on the 30th of December, 1788. His friends Drs. Blair, Robertson, and Hardy, published a volume of his Sermons in 1790, and a second in 1791. These sermons long enjoyed very great popularity, and have been several times reread. They are among the most eloquent that the Scottish church has produced. A third edition of his poems, with an account of his life, appeared in 1805; and the poems are included in Dr. Anderson's collection.

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LOGARITHMS, HYPERBOLIC. As tables of hyperbolic logarithms are not very frequently met with, the following table is given to facilitate the finding of the hyperbolic logarithm by means of the common one. It is fact a table of the hyperbolic logarithms of the powers of 10: thus opposite 12 we see 11,101,412,5, which is the hyperbolic logarithm of 10^12, or a million, in 17 millions.

To find the hyperbolic logarithm of a number, multiply the common logarithm of that number by 2; 2-03255809, by means of the table. Set down the number opposite to the integer of the logarithm, that then oppose to the first pair of decimal figures, leaving out the two last figures, then that opposite to the second pair, leaving out the four last figures, and so on.

Add the results together. But if the characteristic of the common logarithm be negative, subtract the united results of the pairs of decimal places from the result of the characteristic, and make the answer negative. For example, refer to the logarithm of 2, that is the 20-03255809; the 20 is 1, and the 03255809 is -03255809. Subtract 20 from -03255809, and the result is -2003255809. This is the answer, and it is to be placed in the 6th column, opposite the 15, 15 columns following the 3.

Hence the hyperbolic logarithm of 2 is -6-55709553.


LOGARITHMS, USE OF. We have thought it advisable to add to this work directions on the method of using logarithms, independent of all considerations connected with the meaning and theory of those numbers. Thus a person who has a table of logarithms, and finds its logarithmic ex-
any system of tables in part... There are many reasons against our inserting the table of logarithms in a large work of reference, as was frequently done a century ago: we are pretty certain that it would not be used.

1. The object of logarithms is the performance of the second and third operations in the following ascending scales by means of the more easy one which precedes it:—

Addition, Multiplication, Raising of Powers.

Subtraction, Division, Extraction of Roots.

Thus multiplication is reduced to addition, raising of powers to multiplication, division to subtraction, extraction of roots to division.

2. The sum of the logarithms of two numbers gives the logarithm of their product, the difference of two logarithms gives the logarithm of the quotient, and so on. These rules are best expressed in symbols, thus:

\[ \log A + \log B = \log (A \times B) \]
\[ \log A - \log B = \log \left( \frac{A}{B} \right) \]
\[ \log (A^m) = m \log A \]
\[ \log \left( \frac{A}{m} \right) = \log A - m \]

3. The logarithms wanted are taken partly from a table, partly from an easily remembered rule. The integer part of the logarithm is found by the rule; the fractional part by the table.

4. The integer portion of the logarithm is called the characteristic of the number: thus 2167.3 has 3 - 33592 for its logarithm, and 3 is the characteristic of 2167.3. It is very common to call this 3 the characteristic of the logarithm itself; but it is better to fix this appellation upon it in connection with the number from which it arises.

5. The characteristic of a number depends entirely upon the place which the decimal point occupies. But the rest, or fractional part, of the logarithm of that number depends upon the significant figures only of the number, and has no connection with the meaning which those figures gain by their position relatively to the decimal point. Thus 21673, 21.673, .00021673, 0.00021673, 216730000, &c. are numbers with different characteristics, or different integer portions in their logarithms. But the fractional portions are the same in the logarithms of all, namely, -33592.

6. The characteristic of a number may be either positive or negative. For our present purpose, it will be sufficient to lay down the rules for using these quantities, directing the reader who is not used to the distinction to try to explain them by considering positive quantities as gains, negative quantities as losses, addition as junction, subtraction as removal. Thus the addition of a positive quantity (annexation of a gain) is the same as the subtraction of a negative quantity (removal of a loss); and so on. The following examples will illustrate this; the negative quantity being distinguished from the positive one by a bar drawn above it:—

3 and \( \overline{3} \) make 3. \[ \overline{2} \text{ from } 3 \text{ gives } \overline{1} \]
3 and \( \overline{1} \) make \( \overline{3} \). \[ \text{ from } 3 \text{ gives } . \overline{5} \]
2 and \( \overline{7} \) make 9. \[ \text{ from } 2 \text{ gives } \overline{5} \]
4 times \( \overline{6} \) is 24; \[ \text{ from } 2 \text{ gives } 1 \]
carry 3, which gives \( \overline{2} \). \[ \text{ from } 3 \text{ gives } \overline{5} \]

7. The rule for finding the characteristic is as follows. When there are significant figures before the decimal point, the characteristic is one less than the number of them. But when the significant figures begin after the decimal point, the characteristic must be marked negative, and must point out the place in which significance begins. Thus the characteristic of 2791.08 is 3; that of 17462 is 4; that of 0.237 is 1; that of 9.999 is 0; that of .763 is 1; that of 0.198 is \( \overline{2} \); that of 0.00072 is 5.

8. It is worth while to remark that this broken rule, as it seems to be, requires subdivision in the following ascending scales by means of the more easy one which precedes it:—

Addition, Multiplication, Raising of Powers.

Subtraction, Division, Extraction of Roots.

division to subtraction, extraction of roots to division.

In multiplication, the multiplication of the negative figure produces a negative result, and the carriage from the positive part goes in diminution of this number. The last step is:—

6 times \( \overline{3} \) is \( \overline{1} \), \( \overline{8} \) is \( \overline{3} \).
In division, a divisible figure must be sought above the negative characteristic, not below it; and the characteristic must be diminished by 1 in order to make the result correct. The characteristic must be afterwards carried to the right in the usual way.

When \( \overline{21} \) is divided by 6, the first step is:—5 is contained in 25, \( \overline{5} \) times, carry \( \overline{4} \); then 5 is contained in 41, 8 times, &c.

In multiplication, the multiplication of the negative figure produces a negative result, and the carriage from the positive part goes in diminution of this number. The last step is:—

6 times \( \overline{3} \) is \( \overline{1} \), \( \overline{8} \) is \( \overline{3} \).

9. A mixed number, such as \( 3 \cdot \overline{92741} \), is thus multiplied and divided:

\( 3 \cdot \overline{92741} \)
\( 6 \)
\( \overline{63} \cdot \overline{8247} \)

10. The decimal part of the logarithm is taken out of the tables. These are not complete logarithms, which could not be given, since the real logarithms are generally interchangeable decimals. The only numbers which have logarithms capable of finite expression (in the system commonly used) are those in the series: .0001, .001, .001, .01, 1, 10, 100, 1000, ... of which the complete logarithms are the characteristics themselves, or, \( \overline{4}, \overline{3}, \overline{2}, \overline{1}, 0, 1, 2, 3 \). The tables give only a certain number of the first decimal places, and may be named after the number of decimals in the logarithms they give. Thus a table which gives four decimals in each logarithm may be called a four-figure table; and so on. A calculator chooses his table according to the degree of accuracy he wants: the general rule being that, so many decimals as there are in the logarithms, so many significant figures of the answer must be correct, with perhaps an error of one or two in the last figure. Thus if the real answer to a question were \( \overline{00132759738} \), we might expect from four-figure tables to get \( \overline{00132759738} \), or \( \overline{001327598} \), or \( \overline{001327599} \). But seven-figure tables would probably give from \( \overline{00132759569} \) to \( \overline{00132759769} \). Perhaps the liability of the last figure to error is, for the general run of questions, rather over than under stated in the above. Four figures is very often enough; five figures almost always. When five figures are not sufficient, we should recommend having recourse to seven at once, for a reason presently mentioned.

We insert specimens of a four-figure, five-figure, and a seven-figure table.
12. To find the logarithms of numbers and the numbers to logarithms, from the four-figure table, proceed as follows:—

From inspection of the number, take the proper characteristic, and then note the first four significant figures. In the row which begins with the first two, find the figures which are in the column headed by the third; and add to them the figures out of the side table which are in the column headed by the fourth.

For instance, required, as well as it can be given from a four-figure table, the logarithm of $4275898.116$. The characteristic is $6$; and the first four significant figures are $4276$ (reading $58$ rather as $60$ than as $50$). In the row $42$, and under $7$, we see $6304$, and in the side table opposite to $6$ is $6$, and $5340 + 6 = 6306$. Hence $6306$ is the logarithm of the number $4275898.116$, as far as the four-figure table will give it. Similarly the logarithm of $4$ (which must be read $400$) is $1.6021$, that of $430$ is $2.6385$, that of $40179$ is $2.6210$.

To find the number to a logarithm, in the four-figure table, use the decimals of the logarithm with the antilogarithmic table in the same manner as the four significant figures were used in the other table to find the logarithm; and then settle the place of the decimal point by means of the integer of the logarithm. The four-figure table goes into so small a space that it is worth while to print an inverse table of antilogarithms, or of numbers to logarithms; of which table we have also given a specimen above.

Thus the number to the logarithm $5.6294$ being required, we neglect $5$, and, going into the antilog with $6294$, opposite to $62$ and under $3$, we find $4198$, and under $4$ in the side table we find $4$. Hence $4198 + 4 = 4202$ are the first four significant figures of the number required; and its characteristic is $5$; whence $4202000$ is the number to the logarithm, as near as the four-figure table will give it. Similarly the number to $6111$ is $4.084$, that to $3.6208$ is $0.04177$, that to $9.6000$ is $398100000$.

13. We give an instance of the application of each of the rules in §2. Let it be required to find closely as four-figure tables will do, the product of $17798$ and $69496$; the quotient of $17.393$ divided by $942942$; the eighth power of $1.2973$, and the eleventh root of $0.000556918$. The processes are as follows:

| Log. of $17798$ (say $17800$) | $4.25044$ | Add |
| Log. of $69496$ (say $69340$) | $4.8023$ | Log. of product $9.0527$ |
| Answer $1129000000$ from the table. |

True Answer $1128655684$ |

Error $144065$, about $0.0101$ of the whole.

Again, log. $17.293$ (say $17.29$) $1.2377$ | Subtract |

log. $942942$ (say $9429$) $1.9745$ | |

log. of quotient $1.2629$ |

Answer $18.33$. |

log. of $1.2973$ (say $1.297$) $0.2549$ |

multiply by $8$ |

log. of $(1.927^2)$ $2.2792$ |

Answer $190.2$. |

In raised powers, the errors are generally larger than in other processes, seeing that the necessary error of the logarithm is multiplied as many times as the logarithm itself.

log $0.0005569181$ (say $0.0005569$) $\frac{5}{7} - 4.585$

Divide by $11$ $1.6133$ log $\sqrt{0.0005569}$ Answer $-1.405$.

14. Before beginning to use five-figure tables, it is advisable to practise the formation of the tens of numbers not exceeding 50, in the head. For instance, which is the nearest integer to 7-tenths of 37. The process at length will of course be $3.7$.

15. In the specimen of the five-figure table will be seen four figures of number, followed by five figures of logarithms, and an additional column marked D, which contains nothing but the differences between the successive sets of five figures in the logarithm. This column D is referred to under the name of the column of tabular differences. To take the logarithm of a number, take the characteristic as before, and five significant figures of the number. Find out the first four significant figures in the table, and their five figures of logarithms add as many tenths of the tabular difference as there are units in the fifth significant. Thus to find the logarithm of $011217$, we find $11217$ in the specimen, opposite to which is $04061$, with $38$ for a tabular difference. Now 7-tenths of 38 is 26.61 and 27 is 88; so 04088 is the decimal part of the logarithm. Similarly if the significant of the number be 11223, the decimals of the logarithm are 05011; also 11901 gives $04926$; 11209 gives $04957$; 58332 gives $76591$; 58335 also gives $76591$; 58334 gives $76592$; and so on.

16. There is no antilogarithmic table to a five-figure table; and the way of finding the number to a logarithm is as follows: Seek out among the logarithms the decimals next under the decimals of the given logarithm, and take the four figures of number belonging to them for the first four significant figures of the number. Find by how much the decimals just used fall short of the given decimals, and call this difference the unattained part. Annex a cipher to the unattained part, and divide by the tabular difference; the digit which most nearly expresses the quotient is the fifth significant of the number. For instance, what is the number to the logarithm $3.05016$. Looking into the table, we find that the number next under $05016$ is 04996, opposite to 1122. The unattained part is 17; the tabular difference 39 and 570 contains 39 times more nearly than 5 times; so that 4 is the fifth figure. The five significant of the number required are then 11224; and, looking at the integer part of the logarithm, the characteristic is seen to be 3; whence $0011224$ is the number to the logarithm, as correctly as five-figure tables will give it.
17. The four questions worked above with four-figure logarithms are thus worked with five-figure logarithms:—

17798 4·25037 17·293 1·29377
65426 6·00227 9·4924 1·97449
1128900000 9·05264 18·589 1·96388
50231 26316
1·9273 0·28495 8·000055692 11·574580
2·0404 61825
190·37 2·27960 27944
10·40
28·160

18. The seven-figure tables have five figures of number, with seven decimals of logarithm; and the sixth and seventh significant of the number are to be provided for by means of the tabular differences. But as these tabular differences run to three and four places of figures, their tenths are written down in small separate tables. [Proportional Parts, P. C.]

To take out a logarithm, take out the seven decimals belonging to the first five significant of the number, and add from the table of proportional parts the number opposite to the sixth significant, and one-tenth of that opposite to the seventh significant. Thus, if we find the logarithm of 46517879, of which the first seven significant are 45617879, look in the table for 45517, and we have

<table>
<thead>
<tr>
<th>Tab. Pro. P.</th>
<th>gives</th>
<th>Do. do</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>6581776</td>
<td>7</td>
</tr>
<tr>
<td>29</td>
<td></td>
<td>7</td>
</tr>
</tbody>
</table>

So the logarithmic required, as far as seven-figure tables will give it, is 3·6581772.

A little practice will enable the calculator to add together, without writing them down, the two contingents derived from the table of proportional parts. The computer must be careful not to miss the change of the third figure of a logarithm, which usually takes place in the middle of a line, though it can only be marked at the beginning. Thus, in the specimen the logarithm of 45003 has the decimals 6580934, but that of 45004 has 6590026, not 6580926. Some mark is usually made to give warning that the change has taken place; but those whose attention is so little alive to the circumstance as to stand much in need of this mark will often make the mistake in spite of it.

To take the number to a given logarithm out of seven-figure tables proceed as follows: Find the nearest decimals under the given decimals, and by subtraction find the unattained part. Take out the five numbers belonging to the attained part, and the first five significant of the number. Look in the table of proportional parts for the nearest under the unattained part, and take the digit opposite to it for the sixth significant. Annex a cipher to the remainder of the unattained part, and take the digit opposite to the result (or its nearest) in the table of proportional parts for the seventh significant. For instance, required the number to the logarithm 1·6590176:

<table>
<thead>
<tr>
<th>45605</th>
<th>gives 6590176</th>
</tr>
</thead>
<tbody>
<tr>
<td>6590125</td>
<td>51</td>
</tr>
<tr>
<td>48</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

Number required 45·60533

20. The following is the working of the four questions already worked with four-figure and five-figure tables:

17798 4·25037 17·293 1·29377
65426 6·00227 9·4924 1·97449
1128900000 9·05264 18·589 1·96388
50231 26316
1·9273 0·28495 8·000055692 11·574580
2·0404 61825
190·37 2·27960 27944
10·40

17·293 1·29377
9·4924 1·97449
18·589 1·96388
2·27960 61825
27944

18·38941 1·253853

21. More complicated questions may be directly solved by logarithms, that is, without requiring to seek the number to a logarithm until the end of the process, as long as the multiplications, divisions, inversions, and evolutions are not broken by additions or subtractions. Thus to calculate \( (ab + c) / (d + e) \) we form the logarithm of the answer

\[
\frac{1}{10} \left( 2 \log a + \log b + \log c - \log d - \log e \right)
\]

But if additions or subtractions intervene, the process must be broken to produce the result; that is, the logarithmic process must be suspended, and the results exhibited in numbers for the performance of the additions and subtractions (unless indeed the logarithms described in the next article be employed). Thus to find \( \sqrt[4]{(a^2 + b + c)} \), it would be necessary, not merely to form the logarithms of \( a^2 \) and \( c \), or \( 2 \log a + \log b + \log c - \log d \), but to find the numbers to them: these numbers being then added, and the logarithm of the sum being taken, half the last logarithm is the logarithm of the answer.

22. There is nothing in the trigonometrical logarithms more than is described in Trigonometrical Tables, P. C. Many young students, from seldom or never using the actual sines, cosines, &c., of angles, but only their logarithms, are apt to confound the former with the latter.

23. Some little additional correctness may be obtained by annexing to the use of the tables, as given above, an attempt to add a mere check to the one more figure of the number. Thus suppose it required to find the logarithm of 11·374928. In the four-figure table 113 has 0531 and ... 7 adds 26. The next figure is 4, which, had it been the fourth significant, would require the addition of the whole of 15; being the fifth figure, let it add the tenth of 15, or its nearest integer, 2. Hence we add 28 instead of 26 to 0531, and get 0559 instead of 0557, as a nearer approach to the logarithm. Again, in the five-figure table, 1137 gives 05670, and the tabular difference is 38. The 4 gives 15, or 4-tenths of 38, and the 9 ought to give 9-hundredths of 38, or 3. Consequently 15 + 3, or 18, is added, giving 05694. Had 49 been read as 60, in the usual way, 19 would have been added. In the seven-figure tables 11374 gives 0559132; 9 adds 345, the 2 should add the tenth of 77, and the 8 should add the hundredth of 306; hence 3 more should be added as from the figures 92.

This plan may be followed when the greater part of the desirability, especially in the four-figure table. It is most useful when the tabular differences are large, that is, at the beginning of the table.

24. It may sometimes save a mistake if the computer remember that the significant of the number generally read less than those of the decimals in the logarithm. Thus 200... has 301,... for the decimal figures of the logarithm. It is 1, so however at the beginning of the table, and the figures of the logarithm overtake those of the number between 13712 and 13713.

25. The rule of the characteristics, when well learnt, furnishes one of the easiest modes of assigning the place of a decimal point in a common division. For example, in dividing 0·017643 by 0·18416, the characteristics being 3 and 2, we shall have to carry 1 to 2, because the significant of the divisor, 18, is greater than those of the dividend, 17. Take 1 then from 3, which leaves 2, the characteristic of the quotient, which has therefore 0 before its significants. The rule is, to find the characteristic of the quotient, from that of the dividend subtract that of the divisor, carrying 1 if the significant of the divisor be greater than those of the dividend.

26. In using the trigonometrical tables, or any other, careful attention must be paid to the right choice of the method of interpolation. If the argument and tabular result [Tables P. C.], or the numbers with which we enter the table and those which we take from it, increase together or diminish together, then the alterations introduced by the table of proportional parts consist in adding to every addition to the other, and subtracting for every subtraction. But if
the tabular result diminish as the argument increases, then every addition to the one is accompanied by a subtraction from the other, and vice versa. In the tables of logarithmic cosines and cotangents, the young computer frequently finds itself far from the goal of the last indicated direction. Thus the logarithm of the cosine of 84° 9' in a five-figure table is 9·00828, and the tabular difference is 124, diminishing. Hence the log cosine of 84° 9'5 is not 9·00828 +·00006, but 9·00828 -·00005. And if we ask for the angle whose log-cosine is 9·00840, we find the next underneath this in the table to be 9·00829, and 22 for the unattained part. Divide 220 by 124, and 2 is the nearest integer. But the angle required is not 84° 9' +·02, but 84° 9' -·02, or 84° 8'.

27. The equation $a' = b$, in which $x$ is unknown, is solved by taking the logarithm of both sides, which gives $x \log a = \log b$. This is sometimes called log-logarithm. The angle required is also obtained by adding the logarithm of $a'$ to the logarithm of $a$. The result is the same as by Briggs's method of interpolation between logarithms.

The reader is supposed to know the complete interpretation of algebrical exponents. We have then

$$x = \log (\cdot00163) \div \log (\cdot47) = 3·21919 + 1·76596$$

$$y = \log (\cdot182) \div \log (\cdot47) = 1·77815 + 2·26007$$

Now throw the three logarithms which have negative integers into the more usual algebraical forms.

$$211219 - 3 = 75696 - 1 = 77815 - 1$$

or $-24804 + 282186$

And make the divisions, which give for the quotients 11·471, and $-0988161$; or

$$\left(\frac{4}{7}\right)^{11·471} = \cdot00163, \quad (182) -0988161 = \cdot6$$

LOGGAN, DAVID, a line-engraver and designer, of considerable eminence in England in the time of Charles II., was born at Danzig in 1653. He appears to have first learnt his art from Lyonson, in The Hague, and, after working subsequently with Hondius in Holland. He came to England during the Commonwealth, and spent some time in engraving heads in London. But his first work of consequence in this country was a set of plates of the colleges of Oxford—' Oxonia Illustrata,' for the sale of which he had fifteen years' privilege; he executed afterwards a similar series of the colleges of Cambridge. He also engraved on eleven folio plates ' Habitum Academiconior Oxfire.' A Doctor de Servientem.' Loggan is himself entered on the books of the University; in the matriculation registry there is the following entry—'

David Loggan, Gedenusia, Universitae Oxon. Chalchopographya, 1672.'

He married Mrs. Jordan, of a good family, near Witney, Oxfordshire, by whom he had a son, who became a fellow of Magdalen College, Oxford. He died at his house in Leicester-fields in 1685.

Loggan engraved many portraits of illustrious persons in the time of Charles II., many of the drawings of which were executed in lead by himself from the life—as King, prince of Denmark; the Duke of Albemarle; the Earl of Clarendon; the Earl of Argyle; the Duke of Ormond; the Lord Keeper Guildford; Archbishop Sancroft; the Bishops Mew, Seth Ward, and Pearson; and many others. There are prints also by Loggan of Archbishops Usher and Boyle, and of Bishops Sprat of Rochester, Lake of Chichester, Crew of Durham, Compton of London, Gunning of Ely, Reynolds of Norwich, and Lloyd of St. Asaph. He engraved also three portraits of Charles II., in one of which the king is leaning on his hand on Archibishop Sheldon; James, duke of York; the Duke of Monmouth; the Queens Catherine and Henrietta Maria; Pope Innocent XI.; the Earl of Derby, Sir Edward Coke, Sir John Chardin, Thomas Barlow, Titus Oates, and many others, which are enumerated by Vertue.

Loggan had the following assistants—A. Blooteling, G. V. Winter, and R. Williamson; the first two came from Holland with Loggan. (Vertue, Catalogue of Engravers, &c.)

LOIR, NICOLAS, a distinguished French painter and etcher, was born at Paris in 1624. His father was an eminent jeweller, and he placed Nicolas with Sebastien Bourdon, and sent him afterwards, in 1647, to complete his studies in Rome. Here Loir studied chiefly the works of N. Poussin, and so carefully that in some instances it is said to be scarcely possible to distinguish Loir's copies from originals. He had great facility of execution, and excelled in various styles, as history, landscape, and architecture. He also composed with elegance, and his colouring is very agreeable; but his design is somewhat affected, and is not always vigorous or correct in its outline.

He painted at Rome an excellent picture of Darius opening the Tomb of Sesostris, which obtained for him a great reputation. He returned to Paris in 1649, and was shortly afterwards employed by Louis XIV., at the Tuileries and at Versailles. He painted two apartments in the Tuileries—the Antichambre du Roy and the Salle de Gardes, where, by the mythical representation of the sun and other figures, he illustrated the distinctive character of the life and reign of Louis XIV.; and so far to the monarch's satisfaction, that he obtained by these works a life-pension of 4000 francs.

In 1663 he was elected a member of the French Academy of Painting, and he presented on the occasion, as his reception-piece, a picture representing the Progress of Painting and Sculpture during the reign of Louis XIV.; but his master-piece is considered Cleobis and Biton drawing their Mother in a chariot to the temple of Juno, from the story of Herodotus (v. 31); Loir himself has made an etching of it. Another of his best works is Paul before the Rabbi before the Magician of sight, in the Cathedral of Notre Dame at Paris. He excelled in painting women and children, and particularly the Virgin Mary. He is said to have designed twelve Holy Families in a single day, which did not seem to him two figures alike. He died at Paris, rector of the Academy, in 1679. Loir's own etchings amount to 159 pieces, which, together with 90 engravings after his works by other artists, makes a total of 239 prints. Several of the latter were engraved by his brother Alexis Loir.

Felibien describes several of the works of Loir at considerable length; his account of this painter contains also some curious digressions relating to the superstitions of the modern Romans, and other matter. Felibien and Loir were at Rome together, and Felibien's dates have been for this reason adopted in this article, where they differ from those of D'Argenville and Gault de Saint-Germain.

(Felibien, Entretiens sur les Vies et sur les Oeuvres des Peintres, &c.; D'Argenville, Abrégé de la Vie des plus fameux Peintres, &c.)

LOMBARDUS, LAMBERT, the designation of a painter whose actual name is not known. He is sometimes called Lamprecht Susterman or Sutermair, and, according to some, Lambert Savius; and Lamprecht Susterman appears to have been the name applied to him, but his birth is equally unknown: it is said to lie to Liége or Amsterdam, more probably Liége, as he settled there after his return from Italy in 1658, and he died there in 1660, aged forty-four. Vassal also gives the name of Lamprecht. He is distinguished all the Flemish painters, and styles him a great letterato, a judicious painter, and an excellent architect; but his account of his pictures is confused by confounding Lamprecht Savius, who wrote Lambert's Life in Latin: it was published at Bruges in 1665, five years after his death. Lombardus studied under Jan de Marbins before he visited Italy. Frans Floris, Hubert Goltius, and Willem Key were his teachers. His works consist chiefly of drawings with the pen in chiaroscuro; his coloured paintings are scarce; there are two small dimensions in the Gallery of Berlin; there is a Fetta in the University of Pisa which used to be attributed to Daniele da Volterra. Lambert's style is strictly Italian: he is said to have studied under Titian at Venice, and he lived some time in Rome. The surname of Lombardus was probably given to him by his Flemish countrymen on account of his style, which, different from their own, they distinguished as the Lombard style, Lombardi being formerly the general name for the northern part of Italy.

There are many prints supposed to be after Lambert's designs, some of which are marked Lam., and others Savius; and it is not yet decided whether these names indicate one or two artists. Held regards them as two, and Van Mander calls Savius an engraver, and making any allusion to Lombardus. In a note to De Yongh's edition of Van Mander, Savius is styled the pupil of Lombard, and Van Mander, Het Leven der Schilders, &c.; Sandart, Teutsche Academie, &c.; Heineken, Vasi,
LONDONDERRY, ROBERT STEWART, MARQUESSE OF, was born at the family seat of Mount Stewart, in the county of Down, in Ireland, on the 1st of November, 1628 (the same year which gave birth to the Duke of Wellington and to Napoleon Bonaparte). His father, of the same name, after representing the county of Down for many years in the Irish parliament, was made Baron Stewart of Londonderry in 1679, Viscount Castlereagh in 1725, Earl of Londonderry in 1756, and Marquess of Londonderry in 1716—all in the peerage of Ireland. Robert was his only child, and survived him by his first wife, Sarah Scott, daughter of Francis Seymour, First Marquess of Hertford, whom he married in 1676, and who died in 1707.

The estate of Mount Stewart was purchased by Mr. Alexander Stewart, father of the first marquess, who sat in the Irish parliament for the city of Londonderry. Before this the family were known as Stuarts ofBallylawn in the county of Downe, of which property John Stewart, the great-grandfather of Alexander, the first of them who settled in Ireland, obtained a grant from King Charles I. There seems to be ground for believing that he was nearly related to some ennobled branch of the Stuarts: but the connection appears not to be distinctly traceable, and is variously given in the several accounts. The descent of the family is commonly deduced, or rather assumed to be, from Sir Thomas Stuarts of Dalwinton. In the latter part of the fifteenth century, the ancestor of Lord Blantyre, and a younger brother of Sir Alexander Stewart of Dalwinton and Garlies, the ancestor of the Earl of Galloway. John Stewart is stated to have emigrated from Scotland to Ireland in the reign of James I.

The subject of the present notice received the first part of his education at the free grammar-school of Armagh; whence he was removed in 1766 to St. John's College, Cambridge. He was not yet 21 years of age when he entered at the age of 20 he performed himself for the vacant seat in the representation of the county of Down, and was returned, though not without a severe contest, which lasted for two years, and is said to have cost the family 25,000l. or 30,000l. Nor did he come in without so little or in excess of his allowance, in contradiction to what had hitherto been the family politics, to the cause of parliamentary reform, which had for some time been a popular watchword in Ireland. For three or four years, accordingly, he was considered as belonging to the party of the opposition, though to the aristocratic and more moderate section of it. He very early began to take part in the debates.

His conversion from liberalism seems to have taken place about 1738 or 1742; and it may be fairly considered to have been as the result of his acquaintance with the more alarming aspect which political parties in Ireland were every day assuming. Up to this time he appears to have been universally regarded as an unusually amiable as well as a very young man; after the years of the ministry, he was commonly represented as a prodigy both of perspicacity and of heartlessness.

In the summer of 1784 he returned to the British parliament for the county of Down; and after remaining absent for a session he made his maiden speech in the House of Commons in second rowing the 29th of October, 1755. It is said to have greatly disappointed the expectations excited by the reputation he had brought over with him. He was to the last a remarkably unequal speaker; at one time rising above, at another time—sometimes on the same night—falling below his ordinary or average style of execution, a degree scarcely credible, and the more wonderful in a person of such nerve and self-possession. He does not appear to have ever spoken again during this parliament, which was dissolved after the close of that sixth session, in May, 1756. That year he became Viscount Castlereagh; and he was again returned to the next British parliament, which met in September, for the borough of Oxford. But he vacated his seat in July, 1767; upon which he was re-elected to the Irish parliament for the county of Down, and was made Keeper of the Privy Seal for Ireland. In the beginning of 1798 he was appointed Secretary to the Lord Lieutenant in Ireland, on the recommendation of Lord Castlereagh, and from that time to his death he may be regarded as having been distinctly the ministerial leader in the Commons. The credit or discredit of the measures adopted for the suppression of the Rebellion, which broke out and was put down in this year has also been commonly assigned to him, although it does not appear that he really did more than carry out the system which he found already in action when he came into office. He was no doubt one of the principal managers of the project of the Union, which followed two years after.

He was a member of the last house of Lords appointed by the Imperial Parliament, which met in February, 1801; and also to the second, which met in November, 1802; though upon the latter occasion not till after a severe struggle with the interest of the Downshire family, whose hostility had been prevented by the dismissal of the late marquess from the command of his militia regiment and the lord-lieutenancy of the county for his opposition to it.

In the beginning of 1802 he had been made a privy counsellor of Great Britain, and President of the Board of Control; and he retained that office after Mr. Pitt retired and throughout the additional administration. After Mr. Pitt returned to power, Viscount Castlereagh was, in July, 1805, promoted to be one of his majesty's principal secretaries of state (taking the department of War and the Colonies). He was now, however, thrown out of the representation of Down; and was obliged to take refuge in the borough of Boroughbridge, for which he was returned in January, 1806, on a vacancy made by the death of the Hon. John Scott, son of Lord Eldon. He resigned with the rest of the cabinet on the death of Mr. Pitt shortly after this; and to the next parliament, which met in December, a new ministry, he was returned for the borough of Plympton Earl.

Upon the dissolution of the last, and previous to the election in April, 1807, Lord Castlereagh was reappointed to his former office of Secretary of State; and he was again returned for Plympton to the parliament which met in May of this year. He was now more considered, more trusted, and more beloved than ever, though he had been a principal instrument in the conduct of the war; and the failure of the disastrous expedition to Walcheren in the summer of 1809 not only drew upon him much general unpopularity, but involved him in a personal quarrel with his colleague, the Secretary for Foreign Affairs, which led first to the resignation of both, and then to a duel between them, in which Canning, on the second fire, was severely wounded. In the earlier part of this same year, also, some solicitation had been made by two select committees of the Commons which charged Lord Castlereagh, along with other persons, the one with corrupt practices in obtaining the returns of members for Irish boroughs, the other with irregularities in the disposal of Indian patronage.

Lord Castlereagh remained out of office till February, 1812; when, on the resignation of the Marquess Wellesley, he was appointed Secretary of State for the Foreign Department.

After the death of Mr. Perceval, which followed in May, he was regarded as ministerial leader in the Commons. To the new parliament which met in November, 1812, he was again returned for the county of Down; and he also retained that seat in the next two parliaments, which met in August, 1818, and in April, 1820. The return to office of Mr. Canning, however, in 1816, had relieved him of the duties of the department of home affairs; but left him in public business in the House, till that gentleman again retired in 1820.

Meanwhile in the end of the year 1818 Lord Castlereagh had engaged in pleasant Ministerial negotiations opened with the French government at Châtillon, which however broke off a few weeks without any result; and he had also appeared as representative of the King of England at the Peace of Paris, in May, 1814; at the Congress of Vienna, in October of the same year; at that of Paris after the battle of Waterloo in the following year; and at that of Aix-la-Chapelle in 1818. On such occasions he was, for his presence and manner showed to great advantage. He likewise attended George IV. to Ireland in 1820, where he had for the moment the gratification of being extremely popular among his countrymen. He had been made a Knight of the Garter in 1818, and he became Marquess of Londonderry by the death of his father on the 8th of April, 1821.

Lord Londonderry died by his own hand at his seat of North-Grey-Place, in the county of Down, on the 27th of August, 1822. Something unusual in his manner had been occasionally observed for some months, and for a few days before the melancholy catastrophe his extreme irritability and passion of temper, and other symptoms of distress: and from these circumstances of notice of his domestics and friends. On the 9th, the Duke of Wellington wrote to Dr. Bankhead:—"I sincerely hope that you will contrive, by some pretence, to go down to his lordship's house. It does not look in any way well; he appears to me to have been exceedingly harassed, much fatigued" and over-
worked during the late session of parliament; and I have no doubt he labours under mental delirium; at least this is my impression. The coroner's jury which sat upon the body brought in a verdict of lunacy. He had married in 1794 Lady Emily-Anne Hobart, youngest daughter of John, second Earl of Buckinghamshire, and the title went to his half-brother, the present Marquess.

There was no brilliancy of intellect in Lord Londonderry, so far as literature and the study of the classics were concerned, but he possessed a variety of other qualifications and enjoyed the reputation of a great man. He had studied the works of ancient Roman writers and lived among them in the year 529 when he died. He practised as a physician at Frankfort-on-the-Main, and wrote a Herbal, which was merely a compilation of what had been done by others. There is also a John Lonicer mentioned who wrote a commentary on Dioscorides.

This genus is the type of the natural order Caprifoliaceae, and has the tube of the calyx 5-toothed, the corolla tubular, campanulate or funnel-shaped, with a 5-leafed usually irregular limb; 5 stamens; a filiform style, a calyptra stigma; 3-seeded berries, and crustaceous seeds. The species are erect or climbing shrubs, with opposite exstipulate leaves and axillary flowers. There are about 60 species of Lonicerus, many of which have handsome flowers and emit a delicious perfume.

L. caprifolium, Goatseale, or pale perfoliate Honeyuckle, has ringlet whorled terminal and sessile flowers, deciduous obtuse leaves glabrous on both sides, the stem and calyx-base perfoliate, the style glabrous. It has a twining stem, with white or purplish flowers and orange-coloured berries. It is native of the middle and south of Europe, and is found on woods and thickets in many parts of England and the south of Scotland.

L. Periclymenum, the Woodbine, or Honeyuckle, has climbing branches, the leaves all separate, deciduous, sometimes downy, glabrous beneath, ovate, obtuse, entire, the stem tinged at the base, upper ones the smallest; the heads of flowers all terminal ovate, imbricated; the flowers ringlet. The flowers are pale yellow, the berries red, and accompanied with permanent bracts. This plant in early times was supposed to possess powerful medical properties, but it is not now used. It is however extensively cultivated in the gardens and shrubberies of Europe on account of the delicious perfume of its flowers. This plant is the true 'woodbine' of the poets, and Milton has applied to it the name 'twisted eglantine.' This plant has obtained the name of woodbine, a corruption of wood-blind, from its habit of twisting round the stems of trees.

Thus Shakspeare says—

So doth the woodbine, the sweet honeyuckle, Genly entwine the maple.

The name honeyuckle is derived from the habit of children, who draw the corolla out of the calyx, and suck the collected honey from its nectary. Several varieties of this plant are recognised by botanists. All these are beautiful climbers and extend from very fragrant; a little west of Montpelier, the Sposolizio, or the Marriage of the Virgin, and a Holy Family, after the same; the Entombment, after D. Crespi; the Magdalen, after Correggio; the Madonna del Lago, after Da Vinci; Galatea, after Albani; and many heads, after Rembrandt. The Sposolizio was engraved as a companion-piece, or pendant, to Morgan's large print of the Transfiguration, by Raphael. He commenced in 1527 to engrave the Last Judgement, by Michelangelo, from a drawing by the Roman painter Minardi, but he died without finishing it; it was however considerably advanced, and, if not actually finished, could be completed by some of his distinguished scholars. The Madonna del Velo, after Raphael, Longhi also left unfinished, but it was completed in 1834 by his pupil the Cav. Tochli. Longhi died of apoplexy in 1831. He was a Knight of the Iron Crown, and member of many academies.

Besides a few poems and other essays, there is a treatise on engraving, by Longhi (La Calcofigria), which has been translated into German by C. Barth; and contains a Life of the author, by F. Longhena. A Life of him, also, with a list of his works, was published at Milan in 1831; and there are notices of him in the Kunstblatt, and in Nager's Neues Allgemeines Künstlerlexikon.

LONGICORNES, the fourth family of tetrmerous Coleoptera in Latreille's arrangement of insects. It includes a vast number of large and beautiful beetles, all remarkable for the length of their body, which in many species are several times longer than their bodies. They inhabit woods, where they deposit their eggs beneath the bark of trees, effecting the operation by means of a long, strong, horny ovipositor with which they are provided. The females are usually larger than the males. The larva lives beneath the bark of trees or the wood, in which it bores, and do much damage. The greatest assemblage of species and the largest forms are found in South America; but longicorn beetles are very general in the temperate zones. This family is divided into three great groups, of which the Curculionides, Cerambycidae, and Lepturae are the respective types.

LONCERIA, a genus of plants named after Adam Lonicer, who was born in 1589 and died in 1668. He practised as a physician at Frankfort-on-the-Main, and wrote a Herbal, which was merely a compilation of what had been done by others. There is also a John Lonicer mentioned who wrote a commentary on Dioscorides.

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This plant is a native of Georgia, about Telis, and is a neat little bush with which to form garden-fences.

LORANThUS (from lorum, 'a strip of leather,' and alatus, 'having wings,' alluding to the linear shape and leathery substance of the petals), a genus of plants the type of the natural order Loranthaceae. It has dicoccous or homopodite flowers, the calyx cup-shaped, adnate, with an entire border, the corolla 5-lobed, linear, reflexed stamens inserted into the middle of the petals; the filaments short, anthers globe-shaped; the style thickish; stigma simple; the berry globose, 1-celled, 1-seeded. The species are evergreen shrubs parasitic on trees.

L. Europaeus, the European Loranthus, is a glabrous much branched plant; the branches terete; the leaves opposite, petiolate, oval-oblong; the racemes terminal, simple; the flowers 5-petalled; the petals 5.

This plant is an evergreen parasitic plant, and has the habit of the common mistletoe (Viscum album). It is a native of the southern parts of Europe, and is found on the oak, but inhabits no other tree.

This 'circumstance,' says Burnett, 'has led some naturalists to suppose the Loranthus to have been the Mistletoe of the Druids, and to believe, as it is not now indigenous to Britain, that when Druidism was suppressed, every vestige of that stultuous superstition was so completely swept away that even the sacred plant was extirpated here.' The fact however of the scarcity of the mistletoe upon the oak renders it probable that it was on this account more sought after, and thus contributed to render it an object of superstitious veneration. Several other species of Loranthus have been described, but none of them are easily cultivated, on account of their parasitical habits. L. Loranthus, like those of the mistletoe, contain tannin, and are astringent.

BURNETT, *Outlines*, LOUDON, ARBORETUM ET FRUTICETUM.

LORDS ACT. (REVOLUTION, P. C.)

LORENZI, also BERNETTO, AMBROGIO and PIETRO DI, two celebrated Italian painters of the fourteenth century, were born at Siena about the year 1300. They were brethren, as we learn from the following inscription formerly in the hospital of Siena: 'Hoc opus fecit Petrus Laurentii et Ambrosius eius frater, 1380.' It was attached to pictures of the Presentation and of the Marriage of the Virgin, which were destroyed in 1720; and was preserved by the Cav. Pesci. This inscription explains the name given by Vasari to Pietro, whom he calls Petrus Laurentii or Laurentius, which is evidently an erroneous reading of Petrus Laurenzi — P. S. LAMIO.

Some of the works of these painters still remain, though the principal of their works, by Ambrogio, which is described by Ghiberti (in 'Cod. Magliabechiani,' f. 8 & 9), is destroyed. The picture painted in the Museum at Siena and representing the fatal adventures of some missionary monks. In the first compartment a youth was represented putting on the monastic costume; in another, the same youth was placed, in spite of several of his brothers, about to set out for Asia, to convert the Mohammedans; in a third, these missionaries are already at their place of destination, and are being cheated in the Sultan's presence, and are surrounded by a crowd of soldiers and by a crowd of infidels; the Sultan judges them to be hanged; in a fourth, the young monk is already hanged to a tree, yet notwithstanding he continues to preach the gospel to the astonished multitude, upon which the Sultan orders their heads to be cut off; the next compartment is their ceremonial execution by the sword, and the scaffold is surrounded by a great multitude of foot and on horseback; after the execution follows a great storm, which is represented in all the detail of wind, hail, lightning, and tempestuous weather.

The picture of St. Nicholas in the public palace of Siena, a tempera painting of Peace, represented by a view within and without the city of Siena, with numerous inhabitants variously occupied in business and in pleasure. War was likewise represented in this hall, but is now defaced; there are however other allegorical works still remaining, and Rumohr observes that what remain justify Ghiberti's praise of what have disappeared, speaking with relation to the time of their production — 1393.

Of the several pictures by Ambrogio Lorenzetti mentioned by Ghiberti, only one remains —- the Presentation of the Virgin in the Temple, in the Scuola Regie, and in this same school, the Vision of St. Francis, which, says Ghiberti, was painted in fresco, by one of his pupils, but is now defaced.

Ghiberti does not mention any works by Pietro Lorenzetti, and there is only one authenticated work by him; it is in the Stanza del Filone, a room against the sacristy of the cathedral of Siena, a picture of 'The Assumption of the Virgin,' and the pixittá, a MCCCXXII.' It represents, according to Rumohr, some passages from the life of John the Baptist, his birth, &c.

Vasari mentions many works by Pietro in various cities of Tuscany, where he says his reputation was greater than that of any other Cinabrio's or Giotto's. He attributes to him a picture of the early fathers and hermits in the Campo Santo at Pisa; it is engraved in Lazzini's 'Pitture del Campo Santo di Pisa.' In 1317 he is said to have gone to Rome to paint the cathedral, in which he painted in fresco twelve stories from the life of the Virgin, with figures as large as life and larger, but they have long since perished; they were however in good preservation in the time of Vasari, who completely restored them.

He speaks of parts of them as superior in style and vigour to anything that had been done up to that time.

The works of these painters, though relatively good, are not exempt from any of the errors and defects of the prevailing style in Italy previous to Donatello, Masaccio, and Ghiberti; and they display even some of the barbarities of the Byzantine school. Several pictures are attributed to them in various collections, but wholly without evidence as to their authorship.

(Vasari, *Vite de Pittori, sc.;* DELLA VALLE, *Lettere Scelte di Bartolommeo da Pizzighettone, sc.;* and many others in *Italienische Forschungen, in which the two Lorenzetti are treated of at considerable length."

LOSS ISLANDS. (SIEBRA LEONE, P. C.)

LOVAT, LORENZO, a celebrated Venetian painter of the sixteenth century. He is supposed to have been one of the scholars of the Bellini, and also an imitator of Leonardo da Vinci. He lived long at Bergamo and was generally considered a native of that place; but,' says Lanzi, 'we are indebted to Sig. G. Beltramemi for showing, in a work published in 1800, that Lotto was a native of Venice.' He found him thus noticed in a public contract, 'M. Laurentius Lottus de Venetiis nune habitator Bogomini — Master Lorenzo Lotto, of Venice, now a resident of Bergamo. Lotto lived also some time at Trevigi, at Recanati, and at Loretto, where he died. His works range from 1513 to 1557. As an opera it is said that Lotto's best works could scarcely be surpassed by Raphael or by Correggio, if treating the same subject. His masterpieces are the Madonnas of S. Bartolommeo, of S. Andrea, and S. Giovanni in Bergante. (Vasari, *Vite de Pittori, sc.;* TASSI, *Vite de Pittori, sc.;* Bergamaschi; Lanzi, *Storia Pittorica, sc.*}

LOVAT, LORD. Simon Fraser, afterwards Lord Lovat, was born 1606, a soldier near Pitmen in Scotland. He belonged to the family of the Frasers, who were powerful as early as the reign of Malcolm IV. about 1153, and who had large possessions in Tweeddale and elsewhere in the south of Scotland, and whose last male issue lived until that son was very young. After receiving the usual instruction at a grammar-school, he was sent to the University of Aberdeven,
where he distinguished himself by his accomplishments in this direction.

In 1692 Fraser, through the interest of the Marquis of Athol, received a commission as captain of a company in Lord Tulloch's regiment, but soon afterwards resigned to return to his father's farm near Gogar, about five miles south of Edinburgh. His father, the eldest daughter of the last Lord Lovat, and claimed the estates for her. Simon Fraser, on the contrary, asserted his own right, as nearest male heir, not only to the estates of Gogar, but to the rest of the family. In winning clandestinely the affections of the heiress, then fifteen years of age and living with her mother, the dowager Lady Lovat, near Inverness, and she consented to elope with him, he was caught by her father, and put in a cell to conduct her changed his mind, took her back, and disclosed the plot to Lady Lovat. The heiress was immediately sent under an escort to Dunkeld, the seat of the Marquis of Athol. Fraser made some daring efforts to obtain possession of her, but without success.

About 1700 Fraser went to France, and to ingratiate himself with James II., then living at the court of St. Germain, formally renounced the Protestant faith, and embraced that of the Roman Catholics. James II. having died in 1701, his son, James Francis Edward, resolved to make an attempt to regain his father's kingdom, and Fraser was appointed by the courts of Versailles and St. Germain to stir up an insurrection in the highlands of Scotland. He was made a colonel (some say a major-general), was furnished with credentials to treat with noblemen, gentlemen, and chiefs of clans, and was supplied with a sum of money, for his own expenses, and a certain number of muskets, and landed in Scotland about the end of 1702. He pretended to perform his engagement, but after his return to France in 1703 it was discovered that he had abused his trust, and had disclosed the plot to the Duke of Queensberry. He was confined in the Bastile, where he remained till 1706, when, in order to obtain his release, he offered to enter into holy orders. By the influence of the pope's nuncio and other Roman Catholic ecclesiastics he was set at liberty, he at once retired to St. Omer, entered the College of Jesus, and discharged for some years the duties of a priest with apparent sincerity and much discipline. But his disposition and the advice of his confessor caused him to leave the religious vocation.

When the Rebellion broke out in 1715 Fraser repaired to London, and with some difficulty and risk got to the highlands of Scotland under the assumed name of Captain Brown. His great object was to obtain his hereditary estates; a large part of the clan of the Frasers received him as their chief, and were willing to act according to his decision; and as Fraserdale, who had married the heiress and held the estates, had joined the Pretender, Fraser adhered to the king. He took Inverness from the rebels, and after the Rebellion was suppressed his services were rewarded with the title of Lord Lovat and the grant of the forfeited estates.

His father and mother were the Earl and Countess of Fife. Fraser was the second son of the Laird of Grant, and by her had two sons and two daughters, who survived him. His wife having died, he married a young lady nearly related to the Argyle family, and had a son by her, but his nature was such as to make him deserted. In consequence he was appointed governor of Inverness and lord-lieutenant of Inverness-shire, and lived in tolerable quietness till the second Rebellion broke out in 1745, when he joined the side of Charles Edward, the young Pretender, but kept himself at home, and sent his son with the Frasers, pretending, in his reply to the Lord President, who, on the 28th of October, 1745, wrote to reproach him, that his son had acted without his authority; there was however abundant evidence of his participation, and he fled and concealed himself in the wildest parts of the Highlands; after many escapes he was caught, and conveyed to London. There he was imprisoned, and then was brought to trial till March 9, 1747. The trial lasted seven days, and he was then found guilty, and sentenced to be beheaded. Both before and after his trial he amused every one near him with his jokes. On the 9th of April, 1747, he was led to the scaffold on Tower-hill. He was then eighty years of age, and after sitting awhile in a chair, and talking deliberately to those about him, he laid his head quietly down on the block, and was quickly dispatched. When his body was brought up, his fat neck and his usually short hair, his head was cut off at a single blow. Horace Walpole, who was present, says, 'He died extremely well, without passion, affection, affection, apoplexy, or timidity, his behaviour being natural and pleasing.'


LOU

LOUDON, JOHN CLAUDIGUS, was born at Cambuslang, in Lanarkshire, on the 8th of April, 1810, where his mother's only sister lived. He was the son of Dr. Claudius Buchanan, author of 'Christian Researches in Asia,' then residing. His father was a farmer, and lived at Kerse Hall, near Gogar, about five miles south of Edinburgh. As a child Loudon exhibited a taste for gardening, and as a principal pleasure was in making walks and beds in a little garden his father had given him. He was early sent to reside with an uncle at Edinburgh, in order that he might be educated, and here he attended a public school, and also the classes on botany and chemistry. In addition to the Latin he learned at school, he obtained a knowledge of French and Italian, and paid his master the tribute of many dear lessons from these languages, which he sold. At the age of fourteen he was placed with a nurseryman and landscape gardener, and continued his attendance on the classes on botany and chemistry, and to these added agriculture, in the university of Edinburgh. During this period he acquired the habit of sitting up two nights every week for the purpose of study, a habit which he continued for many years.

In the year 1800 Loudon first published a periodical, and as he brought good recommendations from Edinburgh, he found no difficulty in getting employment in his profession of a landscape gardener. One of his earliest literary efforts was made this year in the publication of a part of a paper in the 'Agricultural Journal,' entitled 'Observations on laying out the Public Squares of London.' It was the practice when this article was published, to adorn the squares of London with a very sombre vegetation, as the years were fresh, and the street gardens of plants. This practice the author strongly condemned, and recommended the lighter trees, as the oriental plane, the sycamore, the elm, and others, which were generally cultivated, and added a great deal to the beauty of the London spaces. In 1804 he returned to Scotland, and in the same year he published his first work, entitled 'Observations on the Formation and Management of useful and ornamental Plantations,' 8vo., London. He returned to England in 1805, and published a small work, entitled 'A short Treatise on some Improvements lately made in Hothouses,' 8vo., Edinburgh. In 1806 he published 'A Treatise on foraging, or the subject of managing Country Residences, and on the choice of situations appropriate to every class of Purchasers,' 8vo., London. This work was illustrated with thirty-two copper-plate engravings of landscape scenery drawn by the author.

He always took his mind as the most important of all the cultivated sciences in the cultivation of this estate, and as a result of his observations he published several volumes on the subject, and at the same time, in his treatise on 'The Utility of Agricultural Knowledge to the Sons of the Landed Proprietors of Great Britain,' he showed how the Scotch Farmer, now farming in Middlesex, This led to his introduction to General Straton, the owner of Tew Park in Oxfordshire, and his undertaking the management of this estate as a tenant. Here he established a kind of agricultural college, in which he engaged to teach young men the principles of farming; and in 1808 he wrote a pamphlet on the subject entitled 'The Utility of Agricultural Knowledge to the Sons of the Landed Proprietors of Great Britain,' &c., by a Scotch Farmer and Land-Agent. He carried on his farming so successfully that in 1812 he found himself worth 15,000l., and being more anxious for the cultivation of his mind than the improvement of his circumstances, he determined to give up his farm and travel on the Continent. He left England in March, 1813, and after visiting the principal cities of Germany and Russia, he experienced a variety of adventures, and recording with his pen and pencil all that he found worthy of notice in his own profession, he returned to his own country in 1814. On his return to London, finding the trade in the chief part of the world was very depressed, he passed through unfortunate investments, he devoted himself with renewed energy to his old profession of landscape-gardening. He now determined to publish a large work on the subject of gardening; and having completed the work, the advantages of terraced gardens, for the purpose of rendering his work more valuable, he visited France and Italy in the year 1819. In the year 1822 appeared his great work, 'The Encyclopaedia
of Gardening,' which contained not only a vast amount of original and valuable matter on every department of horticulture, but was copiously illustrated with woodcuts in the text. This work had a very extraordinary sale, and fully established the author as one of the most learned and able horticulturists of his day. A second edition was published in 1824. The success of this work led him to engage in another equally laborious and extensive work, and on the same plan, devoted to farming. This was published in 1825, with the title 'Encyclopedia of Agriculture.' Another work, though not exactly on the same plan, but similar in design and purpose, was edited by him and published in 1829, with the title 'Encyclopedia of Plants.' This work however contained less of the author's own work than the preceding, the plan and general design being all that he claimed to his own. This was followed by another, 'Encyclopedia of Cottage, Farm, and Villa Architecture,' which was all his own labour. 'The labour,' says Mrs. Loudon, 'that attended this work was immense; and for several months he and I used to sit up the greater part of every night, never having more than four hours' sleep, and drinking strong coffee to keep ourselves awake.' This book was published in 1832, and was very successful. He then planned a work of still greater extent, which demanded more time than any of the preceding: this was his 'Arboraeum et Fruticetum Britannicum;' comprehending an account, with engravings, of all the trees and shrubs growing wild or cultivated in Great Britain. This work was thought out in 1837, and, with the preceding, was published at his own expense. After paying artists and other persons engaged in the work, he found at its conclusion that he owed ten thousand pounds to the various engravers, and that he himself had been employed. The sale of this work was slow, and seemed to have involved him in pecuniary difficulties, which, although they did not abate his energy, still preyed upon his mind, and hastened his end.

During the time that these works were going on he edited several periodicals. In 1826 he established the Gardener's Magazine, which he carried on till his death. In 1828 he commenced the Horticulturist and Journal of Agriculture, which was published to 1837, when it passed into other hands. In 1834 he started the Architectural Magazine, which he gave up in 1836. In 1836 he commenced the Suburban Gardener, a monthly publication; so that he had four, monthly works, in addition to the 'Arboraeum,' going on at the same time.

These labours would appear very extraordinary for a man in perfect health and with the use of his limbs, but they become more extraordinary when the circumstances are known under which he wrote them. His first attack of rheumatic fever, in 1806, was so severe as to produce permanent anchylosis of his right wrist, which seriously impaired his ability to write, and this was so severe that after trying the usual remedies he was induced to submit to shooping, during which process his arm was broken so close to the shoulder as to render it impracticable for him to use the pen. He kept on and on a subsequent occasion it was again broken, when it was found necessary, in 1826, to have recourse to amputation. In the meantime his left hand became affected so that he could only use the third and little finger. After this period he was obliged to employ for all his works both an amanuensis and a draftsman. With this infirm and maimed body, his mind retained its vigour to the last. Early in 1843 he was attacked with chronic inflammation in his lungs, which terminated his existence on the 14th of December of that year. He continued working till the day of his death, and died standing on his feet.

In literary men have attempted or executed so much as Loudon, and that under circumstances of the most depressing and afflictive nature. The tendency of his mind was essentially practical, and in this will be found the cause of the success of each of his works. As to his work on gardening he displays great anxiety for the mental improve-
ment and welfare of the class of men who make this their occupation; and the book on which he was employed at the time of his death was entitled 'Self-Instruction for Young Gardeners.' In all his works he never lost the opportunity of pointing out the bearing of his subject on the moral and social improvement of his fellow-creatures. He was married in 1811, and has had one daughter. Mrs. Loudon is the author of 'The Mummy;' 'Ladies' Flower Garden;' 'Ladies' Botany,' &c. The materials for this notice have been chiefly collected from a Memoir by Mrs. Loudon in Self-Instruction for Young Gardeners.' A complete list of Loudon's works is given in the 'Proceedings of the Linnean Society' for 1844.

LOVELACE, RICHARD, born in 1618, was the son of a Kentish knight. Educated at King's College, Cambridge, and at Oxford, he was placed at the Harvard, and entered in 1646 under the patronage of Goring. On the close of the civil war, he retired to his paternal seat, Lovelace Place, near Canterbury, where he continued to reside till his death. He was created a peer of Ireland in 1661, and was made a baronet in 1673 by the king to the Long Parliament; and for doing this he was imprisoned in the Gatehouse, and released only on giving bail in forty thousand pounds. In 1648 he raised a regiment in the employ of the Duke of York, and was made a major in Dunkirk: and it is said that the lady he married in his poems married another person, on a false report that Lovelace had died of his wound. Returning to England in 1648, he was again in the army by another force, and died after the king's death. In 1649 he published a volume of poems, entitled 'Lucretia's Odes, Sonnets, Songs,' &c. He had spent his fortune freely in serving the royal cause. He now fell into embarrassment and sickness, and lived for some years wretchedly. He died of consumption, in a mean lodging in London, in 1658. Lovelace was the author of two plays, which have never been printed. His lyrical poems, with much inequality and many other faults, are full of spirit and vigour. Specimens of them are in all the common collections; and one or two of them, such as the fine verse 'To Althea from Prison,' furnish some of the most haughty and Tecumseh scenes. LOWELL, a large manufacturing city in the United States of North America, is situated in the State of Massachusetts, on the south bank of the River Merrimack, where the Concord River joins it. It is 16 miles from Boston, 121 miles from Philadelphia, W. long., 489 miles from Washington, and 26 miles north from Boston by the railway. The site was formerly the head-quarters of the Pawtucket Indians, whose territory extended to the north of Massachusetts Bay, and included the present State of New Hampshire. The Pawtuckets amounted to about 12,000, and Wamesit, their chief town, was at the junction of the Concord River with the Merrimack, where the road from New Hampshire first visited by the Europeans about 1650, the population of Wamesit was about 3000; but the Pawtuckets rapidly gave way before the white settlers; in 1674 the population of Wamesit was reduced to 250 men, besides women and children. The lands belonging to the Pawtuckets on the west of the Concord River were given up in 1686, and those on the east in 1726. The banks of the Merrimack were covered with a forest, and it soon became an object of importance to float the timber, lumber, and fuel which it furnished down the river to Newburyport. In doing this the chief difficulty was in passing the falls, which were about thirty-two feet over a series of rapids. On the 27th of June, 1792, an act was passed which constituted certain persons into a body politic and corporate, by the name of the Providence Water Company, and gave them the privilege of fixing their works westward of the Merrimack falls. The works was forthwith commenced, and was completed in 1797; it extends from the Merrimack just above the Pawtucket Falls, in a sweep of a mile and a half, to the Concord River, near the point of junction of the Concord with the Merrimack. The descent of thirty-two feet was accomplished by four locks. Into this canal the whole stream of the Merrimack could be turned, and might thus afford an immense water-power, perfectly under control, to be applied to manufacturing purposes. For upwards of twenty years this vast water-power seemed to have been little noticed. In 1813 a cotton manufacture was erected on the Concord River, a little above the canal, which was increased in 1818 into a woollen manufactory comprising 250 looms, and were very successful. The Waltham Company, having discovered the use which might be made of the water-power of the Pawtucket Canal, purchased the shares of the Concord River Company in 1822, and incorporated under the title of the Merrimack Manufacturing Company. They enlarged the Pawtucket Canal, making it sixty feet wide and eight feet deep, and connecting it with the Merrimack by a cut, and the Pawtucket Canal to the Merrimack River, and on this latter canal the first manufactories were erected in 1823. The town was at first called East Chelmsford, and in 1830 contained 200 inhabitants. In 1826 the number of inhabi-
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ants had increased to 2500, and on the 1st of March in that year East Chelmsford was incorporated into a town called Lowell. Frankfort and Lowell were at this time the son of the Hall, John Lowell, LL.D., and was born in 1774, in Newburyport, Massachusetts. In 1810 he visited England, and on his return he invented, in conjunction with Parker and others, a machine for the manufacture of cotton. This machine, adopted in Watervliet in 1812-13, the first power-loom which were brought into extensive operation in America, though upwards of twenty other machines had been patented at Washington previously. Lowell's company was incorporated in 1829; and on the death of the firm before mentioned, were afterwards transferred to Lowell. Mr. Lowell died in 1817, at the age of forty-three.

Such was the origin of Lowell, the population of which, in 1830, was only 3600; and in 1837 it was incorporated as the City of Lowell, and the population was then 17,683; in 1840 it was 20,921; and in 1844 it was 25,163; and is now (March, 1845) probably about 30,000.

Of this population about one-third, or 10,000, are persons employed in the cotton and woolen manufactories, or mills, as they are called, and of these about 7000 are females and 3000 males. One interesting peculiarity connected with the Lowell mills is the superior character of these female operatives, as they are called in America, or factory-girls, as they are called in England; and of this superiority a singular proof was afforded by the periodical work called 'The Lowell Offering,' a Repertory and Repository of Universal Interesting Subjects, produced by females actively employed in the Mills'; the first number of which appeared in October, 1840, and the first volume was completed in December, 1841. A second volume was completed in July 4, 1843; in 1844, the monthly selection from the two first volumes, under the title of 'Mind amongst the Spindles,' formed the second volume of the series of 'Knight's Weekly Volume,' in the editor's preface to which, and in a letter from Miss Martineau annexed to it, an interesting account of these female operatives is given.

There are about twelve large manufacturing companies, or corporations, besides several smaller companies. A brief description of the arrangements of a Lowell corporation is partly explain the means by which the moral if not the intellectual superiority of these girls is produced. On the bank of the river, or of one of the canals, stands a row of two, three, four, or five mills. A short distance from the mills are long blocks of brick boarding-houses, which are connected with the mills by a line of one-story brick buildings, containing the counting-room, superintendent's room, clerk's room, and store-rooms. The mill-yard is included in such a manner that access can only be had to the mills through the counting-room. On one side are the boarding-houses, which are let only to persons of approved character, and are entirely under the supervision of the company. No one is allowed to enter the rooms of the operatives, but distinct tenements are appropriated to each sex. The hour for taking meals is uniform throughout all the corporations. The number of hours which the mills run, and consequently during which the operatives are employed, taken on an average, is twelve hours ten minutes. The rate of wages varies. A young woman from the country, employed at first as a spare hand and in learning the business, receives fifteen cents per week besides her board. In a few months she will earn a dollar or a dollar a half per week, according to her dexterity and diligence. While however the average of the mill girls is about two dollars per week, besides board, instances are not uncommon of their earning three and four dollars per week, besides board. The payments are entirely by notes, converted into cash at the bank.

As connected however with the superiority of the Lowell female operatives, it is to be observed that they are quite a different class of females from the factory girls of England. The condition of the former is the most respectable brought up in farm-houses or elsewhere, and seldom remain more than three, four, or five years, when they return to their homes, and are succeeded by others in continuous succession.

There are in Lowell twenty-three regularly constituted religious societies, and they have erected about twenty churches. Connected with these societies are 6123 Sunday-school pupils and 1125 teachers, or an average of about 8.73 to each society. There is 1 High School, 8 Grammar-schools, and 30 Primary Schools; a City-Library, of which a catalogue of 5000 volumes has been printed; a Savings-Bank, incorporated in 1829, which has about $500,000 in deposits; 20 factory girls, the amount of whose funds at interest is estimated at 100,000 dollars. Two per cent. interest is paid for every six months. The Lowell Dispensary was incorporated in 1833; the Lowell Home Institution was established in 1839. There is a large Almshouse, a Poor-Farm, and a Geol. The Lowell Cemetery is on the east bank of the Concord River, a mile above its junction with the Merrimack; it comprises about 150 acres, and was opened in 1820. This Institution is in the care of the Lowell Institute is an association of gentlemen for the management of a course of lectures which are delivered every winter in the City-Hall, at which many of the female operatives attend.

The City-Hall, for town purposes, with committee-rooms and stores underneath, was completed in 1839; another public hall with reading-rooms and library-rooms was built in 1855 for the use of the Middlesex Mechanics Institution. In 1857 a large market-house was completed. There are two bridges over the Merrimack: one just below the Falls, called the Pawtucket Bridge; the other near the mouth of the Concord River, called the Central Bridge, which is connected with it by a new pier, with a new portion of town on the north bank of the Merrimack.

There are two railroads connected with Lowell. The Boston and Lowell railway, 26 miles in length, was opened in 1841; in 1842 it was extended to Nashua and Lowell railway is 14 miles in length; it paid a dividend in 1844 of 10 per cent.

The following table is given in the 'American Almanac' for 1845:

<table>
<thead>
<tr>
<th>Lowell Statistics, January 1, 1845.</th>
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<tr>
<td>Capital stock</td>
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<td>Number of mills, exclusive of print-</td>
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<td>works, &amp;c.</td>
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<td>Females employed</td>
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<td>Yards made per week</td>
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<td>Yards of printed cotton</td>
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<td>Yards of goods</td>
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<td>Pounds of wood per annum</td>
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<td>Gallons of oil per annum</td>
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<td>Flour for starch, barrels, per annum</td>
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<tr>
<td>Charcoal, per annum</td>
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<tr>
<td>Yards of cloth per annum</td>
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<td>Pounds of cotton consumed</td>
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A pound of cotton averages 35.5 yards; 100 lbs. of cotton will produce 89 yards of cloth. Average wages of females, clear of board, per week, 1.75 dollars. Average wages of males, clear of board, per day, 75 cents. Average amount of wages paid per month, 135,500 dollars.

(Lowell, as it was and as it is, by the Rev. Henry A. Miles, 1845, Lowell, 1845; American Almanac, 1846; Knight's Weekly Volume, vol. i.)

LOXONE/MA. A group of spiral Gasteropoda is thus named by Phillips. The species occur in Silurian, Devonian, and carboniferous strata. (Palaeon: fossile: de denison.)

LOYOLA, IGNATIUS. Don Inigo Lopez de Recalde, more generally known under the name of Loyola, was the youngest child of Don Bertram, lord of Oignez and Loyola, a nobleman of high birth in the kingdom of Navarre. He was born in the year 1411, at the castle of Loyola, in that part of Spanish Biscay afterwards called the province of Guipuzcoa. In early youth he was attached to the court of Ferdinand and Isabel, and spent much time in the study of literature and the classics, and the recitation of psalms; but the vivacity of his disposition little suited him for a situation so devoid of excitement, while the recital of the noble deeds of the Spanish knights, who had lately freed their country from the dominion of the Moors, had exalted the spirit of the young man, and set him on the way to war, and afterwards received him in his
pilgrimage, in order that this severe penance might excite in his mind a deeper remorse for sin. On leaving Mount Serrat, he directed his steps towards Manresa, a small town within three leagues of this monastery. There he repaired to the hospital of St. Dominic, to assist the poor and sick, imposed upon himself a series of new and severe penances. His deeds of charity soon acquired for him celebrity in that town, and, though clad in the rags of destitution, he carried with him the profoundest and most important admiration of the multitude. To avoid the temptation of vain glory, he retired to a cavern hollowed in a rock at a short distance from Manresa, where he redoubled the severity of his penances, and on the day that he arrived, at that moment of inanimate exhaustion at the door of his cell, and was borne back to the Dominican hospital. On his recovery, his mind, weakened by mortifications and fasting, fell into a state of spiritual despondency. His doubts and despair, his fears and temptations, are described with edifying minuteness in his own writings and by his early historians. It does not appear that any particular doctrine had made its impression on the mind of Loyola, as that of justification by faith alone had made on that of Luther. He lived, as it were, within himself, and his emotions were actuated by the alternate inspirations of spiritual anxiety; he has taught us in his 'Spiritual Exercises,' the manner in which he distinguished their influences; the soul being gladdened by the one and depressed by the other.

One day, at length, he awoke as from a dream, his imaginings had portrayed to him the figure of a heavenly messenger. With tears of joy, he gratefully acknowledged the blessings vouchsafed to him, and, refreshed in spirit, he arose a new and a mightier man.

Afterwards he dreamed of a voyage at which he would have been glad to be present. A great king was sailing on the sea, and he heard the people of the city in which he lived, shouting, "May God have mercy on this city!" The king, they said, would one day reign over the waters of the ocean. He awoke with the hope that within a year he would be at sea. He soon afterwards received orders from the general in Spain, to go to the Low Countries, to the court of the Duke of Parma. He was appointed an envoy to the court of France, and he accordingly went to Paris. From there he went to England, and then to the Low Countries. In the Low Countries he settled for some time in Brussels, and then went to Flanders. In Flanders he stayed for a time, and then went to Spain. From Spain he went to Paris, and then to England again. From England he went to Italy, and then to France again. From France he went to Switzerland, and then to the Low Countries again. From the Low Countries he went to Spain, and then to Portugal. From Portugal he went to Africa, and then to India. From India he went to China, and then to Japan. From Japan he went to the New World, and then to the Far East. From the Far East he went to the New World again, and then to the Far East again. From the Far East he went to the New World again, and then to the Far East again.
friends were published by the dishonesty of a fellow-student, and he was again compelled to have recourse to begging for his subsistence. He, however, zealously applied himself to the studies of the University; obliged to recommend his rules, he became well known in the University for the principles of philosophy brought to perfection by the Scholastics. He could be admitted as a theological student, he placed himself in the class of the youngest and least advanced scholars, and besought their teacher to treat him as one of their juniors. In the early course of his studies, he was later engaged in the laborious acquisition of knowledge, and partly in the endeavor to obtain a salutary influence over his companions. In the latter permit he was eminently successful. Two students of the University, Honoratus (the holy Art. Jasurra), a native of Savoy, of humble origin and simple manners, and Francis Xavier of Narvare, of noble ancestry and aristocratic demeanor. These young men, of such different dispositions and habits, were the first-fruits of Loyola's labors. From that time the three companions formed the closest intimacy, dividing their gains, and sharing each other's toils. Shortly after three more students acknowledged the influence of Loyola, and joined his small society: their names are recorded in the article Jasurra, F. C. On 16th August, 1534, they assembled together at the Church of Montmartre, in one of whose subterraneous chapels Faber, who was a priest, administered to them the sacrament of the Eucharist. They then took the solemn vows of chastity, absolute poverty, devotion to the care of Christians, and to the conversion of infidels. They then resolved on proceeding to Jerusalem, but the case was not in favor of their proposal. This object should be put in their way, they decided upon placing themselves under the guidance of the Pope, and implicitly submitting to his directions. Such was the humble origin of the famous Congregation of the Jesuits. They placed themselves under the banners of Jesus, as soldiers under their chief. The history of the founder now becomes mingled with that of the Order itself. Its early progress, the opposition it met with, the history of its success, and the rules and constitutions by which it is governed, are fully and clearly detailed in another part of this Cyclopaedia. [Jasurra, F. C.]

We will only, therefore, briefly state the principal events in Loyola's life which are not alluded to in that article.

After revisiting his native country, where he religiously repaired the effects of some early faults, he proceeded to Venice, in which city he was joined by his companions, and from thence proceeded to Rome. Their intended departure for Palestine was interrupted by the war which broke out, in 1537, between the Venetians and the Turks; they therefore presented the offer of their services to the Pope of Rome. They were gratefully accepted by the reigning pontiff, who gladly availed himself of the support of a society of men full of spirit and zeal, and capable of the performance of the duties of implicit obedience to his orders. Deeply struck by open schism and lurking disaffection, the Church of Rome found an unexpected source of strength in her own bosom, a source in the society of the Jesuits which she had formed. (Italiam.) On the 27th September, 1540, Paul III. published a bull sanctioning, under some limitations, the establishment of the Order; another was finally issued in 1545, which removed those limitations, and made the sanction unconditional. Meanwhile six of the oldest members met together to elect a president subject to no control but that of the See of Rome; their choice fell on Loyola. He remained at Rome as the centre from which he was to control and direct the movements of the Society. His time was spent there in revising its rules and constitutions, and in works of charity. He founded an asylum for the protection of Jews who had been compelled to renounce their faith, and to whose victims of sensuous seductions might, without binding themselves by any religious vow, lament their sins and reform their lives. In the year 1546 Francis Borgia, whom the Church of Rome had sent to found an asylum in Spain; the statutes were drawn up by Loyola, and the same privileges were accorded to it which belonged to the Asylum of Salamanca. Not twenty years had elapsed since the foundation of the Society at Loyola, then a poor and despised student, had been contumaciously expelled as a factious and illiterate pretender. On the 11th July, 1556, this extraordinary star, worn down by infirmities and self-inflicted mortifications, left a world which for so many years he had looked upon only as a scene of charitable labors. It was a useless task to attempt a delineation of Loyola's character; it is best known by his works. Whatever difference of opinion may be entertained respecting the order of the J'suita, there can be but little respecting their founder.

The memory of Ignatius was conserved by a ceremony known in the Church of Rome by the name of the Feast of St. Ignatius, celebrated annually on the 31st of July, 1609, and he was canonized as a saint by Pope Gregory XV. in 1622. His festival is celebrated on the 31st July.

His Life has been written by Gonzales and Ribaden.dera, two of his early historians, by Jacques de Maffres in Latin, Bartoli, and Bouhouns in French. His 'Spiritual Exercises' were published at Rome in 1548, and have been translated into French by Drooto de Maupertuis and Cioenue. His 'Maxims' were translated at Paris in 1668.

An elegantly written sketch of the life of Ignatius Loyola is contained in 'The Portrait Gallery' published by Knight, vol. vii. By a misprint in this sketch of Knight's, his death is made to take place in 1666. Further information respecting him may be obtained in Ranke's 'History of the Popes,' vol. i. p. 181-200 of Miss Austin's translation; Allan Butler's 'Lives of the Saints;' Fabre's Continuation of Fleury, vol. xxvi.; De Thou, 'Hist. Universelle,' vol. iii.; and Bayle, 'Dict. Historique.' Bayle is chiefly useful in correcting some errors of preceding writers; but the whole is written in a cold and sarcastic spirit.

LUCA'NIDAE, is the family of Stag-beetles, a name popularly applied to these insects on account of the very large and powerful mandibles with which the males are furnished. These in the genera Lamprinus and Picopodes equal the entire length of the body, and in the Luranus cervus of our own country are very formidable instruments of offence. They live during the day in the trunks of trees and old wood, and take flight at night. They are of great number; three to four species have been described as males, which fight with great ferocity among themselves for possession of their mates. The larvae, which is supposed to have been the animal called Cosus by the Romans, and emasculated by itself as a delicacy, lives in the willow and the oak, and remains untransformed for several years. When full-grown it forms a cocoon of the dust of wood which it has ground down by its powerful jaws, and after remaining some time as a pupa it undergoes its final transformation to pass a very brief portion of its life as a perfect insect. Some of the foreign genera of Stag-beetles are remarkable for their brilliant coloring. In Britain we have four species which belong to as many genera. (See Westwood's 'Introduction to the Modern Classification of Insects,' vol. i., and the writings of Macleay, Kirby, Roseel, and Hope.)

LUERNAL MICROSCOPE. This is a hollow pyramidal box, of wood, at the smaller extremity of which is a tube carrying the usual system of lenses for magnifying objects at a distance. At the other end, opposite to the objective, there are two lenses in frames, these, as well as those of the small lenses at the opposite extremity, being coincident with the axis of the box; and between the exterior of the two lenses, and the eye of the observer, there is a plate of glass, rough-ground on one side, which serves as a screen to receive the rays of light proceeding from the object whose representation is to be viewed: the object is fixed in a small frame, as usual, and is placed in a groove made for the purpose immediately beyond the tube containing the system of lenses, at the small end of the pyramidal box.

This box, the axis of which is in a horizontal position, is mounted on a brass stand, which may be placed on the floor or on a table, and the parts of the apparatus are capable of being correctly adjusted by means of screws. The instrument was invented by Mr. George Adams, a distinguished optician in London, and made by him for his own use. He procured objects being projected on the ground-glass screen by the rays of light transmitted from a lamp through the lenses, the observations being made by night or in a darkened room.

The correct adjustment of the instrumental parts is regulated by the achromatism of the lenses at the object end of the instrument, a subject which has been treated in the article Microscopes, F. C.; and therefore it will be sufficient to notice here only the means employed to enlighten the field of view.

For this purpose, in general, an Argand lamp is placed beyond the object, with respect to the microscope; or, if the light is not sufficient, two or more such lamps are placed: the light, after passing through a hemisphere of glass, is, when an opaque object is to be viewed, made to fall in a convergent state upon a small concave mirror, which is so inclined as to reflect the light back upon the object; and
from the different points on the surface of the latter the pencils of rays proceed through the object-lenses and the box to the glass screen.

By the refraction of the light in passing through the lenses a magnified image of the object is formed; and several persons may then place themselves so as to see the image on the screen at the same time; or, by placing the eye at a small aperture in the produced axis of the instrument, one person may, with a pencil, draw on the glass, or on tracing-paper laid over it, the figure of the object; it being understood that, by means of the proper adjusting-screws, the rays in each pencil are made to unite accurately in one point outside the box.

When the object to be viewed is transparent, the light is made to fall in a condensed state upon it, after having been transmitted through a convex lens, or two such; and, from the object, the rays proceed as before to the screen through the system of lenses which constitute the compound object-glass of the microscope, and through those at the opposite extremity of the box.

Instead of having a plate of ground-glass to receive the image, the pencils of light from the object, after passing through the lenses, may be allowed to fall on a board painted white or covered with white paper; the distance of the board from the instrument (about 6 or 8 feet) being such that the rays in each pencil may converge to a point upon it: thus there will be obtained a greatly magnified image of the object, which may be observed by many spectators at one time. It is said to have been used in a segment of a hollow sphere, the light being received on its concave surface; for by that construction the image will be nearly equally distinct at the centre and about the margin.

A lapal microscope, which was presented to the genio of Vesalius by Dr. Lieberkühn in 1738, produces a greatly magnified image of a small object in a similar manner by means of the sun's light. It consists of a coriell tube fixed by its base to a frame of wood, and the latter being screwed to a closed window-shutter at an aperture purposely made in the latter: the tube projects into the room, which, when the observations are to be made, is rendered quite dark, and is sometimes lined with black paper. The rays of the sun are conveyed by a system of lenses contained in the tube, as in other microscopes. On the exterior of the window is a frame carrying a rectangular piece of looking-glass; this frame is attached by a joint at one of its sides to a ring of wood or brass which is made to surround the aperture in the shutter. The mirror, by turning on the hinge, is capable of being fixed at any angle with the wall of the building; while the ring to which it is attached can, by means of a rack and pinion, be made to turn on the horizontal axis of the instrument, so as to permit the rays of the sun, whatever be the position of the latter, to be reflected into the tube. By means of lenses disposed for the purpose, the rays are made to converge on the object; and from thence, after refraction through the system of object-glasses, they proceed to a screen on which they depict the magnified image.

When the object is transparent, the rays of solar light are allowed to pass from the mirror directly through the lenses to the screen; but when it is opaque, a convex lens placed at the aperture in the window-shutter causes the solar rays to condense on a small mirror placed in a box at that end of the instrument which is within the room, and from this mirror the rays are reflected to the object. The condensed light thus thrown on the object diverges from thence and passes through the system of lenses, by refraction in which the magnifying power is produced; these lenses being placed in a tube which, as well as the object, is within the box containing the mirror lens. It is, however, but a little above either side, so that the rays of light proceeding from the object to the magnifying lenses may not be intercepted.

The mirror by which the sun's light is reflected into the microscope is on a pivot connected with a clock-work appara-
tus, by which its position is continually varied correspond-
tionally to the apparent change of the sun's place; and thus the reflected light is made constantly to pass through the two system of lenses, (C. C.)

Sir David Brewster has given, in his 'Treatise on New Philosophical Instruments,' p. 405, &c., a method of preparing objects of natural history for observation by the microscope that may perhaps form a perfect shape and colour, and be thus seen to the greatest advantage.

The solar microscope will, probably, never be generally employed, on account of the necessity which it involves of having an apartment particularly situated, and of being used only when the sun shines. The lacernial microscope can, of course, be employed at any time; and if, for an Argand lamp, the oxy-hydrogen light be substituted, the lenses also being achromatic, there can be no doubt as to the distinct and correctly defined.

[Luchetto da Genova. [Cambrario, Luca, P. C. S.]]

Lucuma (a native name for one of the species), a genus of plants belonging to the natural order Sapotaceae. It has a 5-parted calyx; 5-leafed corolla; 10 stamens, 5 of which are sterile, and 5 fertile, alternating with each other; as ovary is composed of 5 carpels, the fruit large, horned, marked by a large umbilical areola without albumen. The species are trees, yielding a milky juice, with scattered entire coriaceous leaves, and 1-flowered axillary or lateral peduncles.

Mammee, the Common or Mammee Sapota, has obvate lanceolate, oblong cuspidate, glabrous leaves, with solitary flowers. This plant grows from fifty to one hundred feet in height. It is a native of the tropical parts of South America, and of many of the West India Islands, where it is also cultivated. The fruit of this tree is eaten in the West Indies. It is of a large size, oval-shaped, and covered with a brownish rough skin, which in dryness is split off in a rough and luscious, and which, on account of its flavour, is called Natural Marmalade. P. Browne calls a variety of this tree Bully-tree, because it grows the tallest of all the trees in the woods of Jamaica.

Several other species of this genus have been described. They are all natives of various districts of South America, and yield edible fruits similar to the preceding species. They were at one time offered to the gardens of the species of which also yield edible fruits. [Achras, P. C.]

(Don, Gardener's Dictionary.)

Luci, Andre/A DI, commonly called L'Ingenno, and sometimes called Luci, was born at Assisi about the middle of the fifteenth century.

The common story of this painter, originating with Vasari, has been completely overthrown by Rumour in his 'Italianische Forschungen,' published by A. Sisoeby of Dresden. The story, which has been for some time in circulation, and which has been invariably followed by all subsequent writers on the subject, down to the time of Rumour, is that L'Ingeno was the rival of Raphael in the school of Pietro Perugino, that he became suddenly blind while assisting his master Perugino in the Sixtine Chapel, and that the then pope, Sixtus IV., granted the unfortunate painter a pension for life, which he enjoyed until his eighty-sixth year. Rumour has shown this account to be, with one exception, wholly incorrect; the only possible part of it is that L'Ingeno assisted Perugino in the Vatican; this he may have done, as he was his assistant in some works in the Camillo, or Exchange, of Perugia.

L'Ingeno, the pupil of Perugino's fellow-pupil with Perugino, for he painted only one year after the birth of Raphael, in 1484, a coat of arms for the town-hall of Assisi, where he was then established master. He also, after the death of Perugino in 1494, held official stations at Assisi, which can leave no doubt of his retaining his sight. In 1505 he was procurator; in 1507, arbitrator; in 1510, syndic—syndicat

Sir David Brewster has given, in his 'Treatise on New Philosophical Instruments,' p. 405, &c., a method of preparing objects of natural history for observation by the microscope that may perhaps form a perfect shape and colour, and be thus seen to the greatest advantage.

The most certain known work by L'Ingenno is the coat of arms already mentioned. The prophets and sibyls in the Camillo in Perugia are assigned to him, but it is quite uncertain what portion of the frescoes in the galleria at Bevagna, which been attributed to L'Ingeno more for a general aptness for business, than for any special skill in painting.

(Vasi, Vite dei Pittori, &c.; Lanzi, Storia Paitorica, &c.)
LUNAC. (INSANT, P. C.; LUNAC, P. C.) Since some recent acts have made alterations in the proceedings under commissions of lunacy.

An act of the 3 & 4 Wm. IV. c. 36, is entitled 'An Act to diminish the Inconveniences and Expenses of Commissions in the Nature of Writs De Lunatico Inquirendo;' and to provide for the better Care and Treatment of Idiots, Lunatics, and Persons of Unsound Mind, found such by Inquisition.'

An act of the 5 & 6 Vict. c. 84, is entitled 'An Act to alter and amend the Practice and Course of Proceeding under Commissions in the Nature of Writs De Lunatico Inquirendo. The first section empowers the Lord Chancellor to appoint two surgeons or physicians to be called 'The Commissioners in Lunacy:' and enacts that in future all Commissions in the nature of Writs De Lunatico Inquirendo shall be directed to such commissioners, and that such Commissions shall be carried on by the said surgeons or physicians, and that they shall have all the powers, duties, and authorities now had and executed by commissariers named in commissions in the nature of Writs De Lunatico Inquirendo (extant and future), and that all such commissariers (or executors) are to conduct all inquiries with respect to Lunatics and their estates in such manner as the Lord Chancellor shall from time to time direct; and it is provided that nothing in this act shall prevent the Chancellor from issuing any commission in the nature of a writ De Lunatico Inquirendo, addressed to any fit or proper person or persons, in addition to the Commissioners in Lunacy.

§ 3 empowers the Chancellor to refer to the Commissioners in Lunacy, or either of them, any of the inquiries and matters connected with the persons and estates of Lunatics which are usually referred to the Masters in Ordinary in Chancery; and § 4 makes the Commissioners in Lunacy visitors, under the direction of the Chancellor, of all persons found idiot, lunatic, or of unsound mind, by inquisition, jointly with the three visitors appointed by the 3 & 4 Wm. IV. c. 36.

§ 7 empowers the Chancellor from time to time to regulate the form and mode of proceeding before and by the said commissariers, and the practice in matters in Lunacy; and to regulate the number of jurymen to be sworn to try inquests on lunatics, and to establish the fees of such inquests; but it is provided that every inquisition on such commission shall be found by the oaths of twelve men.

By the 8 & 9 Vict. c. 100, § 3, the two commissariers of Lunacy are henceforth to be called Master and Clerk of Lunacy, and to take the same rank and precedence as the masters in ordinary of the High Court of Chancery. Some other regulations as to the duties of the masters in lunacy are contained in § 8 & 9 Vict. c. 100, § 85-96.

The other sections of the act 5 & 6 Vict. c. 84, make regulations as to fees and other matters, for which the act must be consulted. The salary of the commissariers is 2000l. a-year, free from all taxes or assessments.

The term Lunatic is only properly applied to a person who is found to be a lunatic by the verdict of a jury under an inquisition, as explained in LUNAC, P. C. But the term Lunatic is also applied to a person who has been found lunatic, and who is confined in lunatic asylums or hospitals, under such regulations as the 8 & 9 Vict. c. 100, § 49 & 49-49, prescribe, without having been found lunatic under an inquisition; and also to any single patient who is loafered or lodged for pay as a lunatic in a house not licensed under the act, § 90; and also to any person who is under the care of any person who receives or takes the charge of such one lunatic only; and derives no profit from the charge (§ 112).

As to the persons and property of such so-called lunatics, who have not been found lunatic by a jury, the 8 & 9 Vict. c. 100, § 94, enacts, That whenever the com- missariers in lunacy have reason to believe that any person is not in the property of any person detained or taken charge of as a lunatic is not duly protected, or that the income thereof is not duly applied to its maintenance, such commissariers shall make such inquiries relative thereto as they shall think fit, and

P. C. S. No. 115.
report them to the lord chancellor. § 98 enacts, That when any person shall have been received or taken charge of as a lunatic upon an order and certificate, or an order and certifica-

tate under the provisions of that act, and shall either have been in such state of insanity for the last five weeks, or shall have been the subject of a report by the commissioners in lunacy in pursuance of § 94, the lord chancellor shall direct one of the masters in lunacy to inquire and report to him as to the state of such person, so confined, and to authorize the person is authorized to make orders for the appointment of a guardian or otherwise for the protection, care, and management of such lunatic, and such guardian is to share the same powers and authorities as any other guardian of the person, whether a lunatic found such by inquisition now has, and to appoint a receiver or otherwise for the care and management of the estate of such lunatic, and such receiver is to have the same powers as a receiver of the estate of a lunatic found such by inquisition now has; and the chancellor is also empowered to make orders for the application of the income of the lunatic towards his maintenance, and the cost of the care and management of his person and estate, and also as to the investment or other application for the purpose of accumulation of the surplus; but such protection, care, and management are only to continue so long as such lunatic shall continue to be detained as a lunatic upon such order or certificate as aforesaid, and such time not exceeding six months, as the chancellor may fix; but the chancellor may in any such case, either before or after directing such inquiry, and whether the master shall have been or not, direct a commission of inquiry into the nature of a Writ De Lunatico Inquirendo to inquire, to in-

quire of the lunacy of such person.

The Twelve Tables viewed persons of unsound mind (furius) might be deprived of the management of their property on application to the praetor by his next of kin. This legisla-
tion was either introduced or established by the Twelve Tables. The person who had the care of the lunatic and of his property was called a curator. [CURATOR, P. C.] The Twelve Tables gave the care of the lunatic to his suignati. In those cases where the law had not provided for the appoint-
ment of a curator gave the praetor named one. (Dig. 27, tit. 10; Inst. 1, tit. 23.)

LUNATIC ASYLMS, COMMISSIONERS IN LUNACY, STATISTICS, CONSTRUCTION, AND MANAGEMENT OF ASYLMS. HISTORY OF THE NON-RESTRAINT SYSTEM. The subject of insanity and asylums for the insane has of late years occupied a very large share of public attention; particularly as an opini-

on has prevailed that insanity is on the increase in this king-

dom beyond the ratio of population. The want of accurate information renders this point doubtful; but it is certain that more than 20,000 insane persons are in confinement in the pauper and licensed houses in England and Wales, in whom 16,000 are paupers. But as a great number of patients are confined separately, or in the care of their relatives, of whom no public returns are made, this number is probably far below the true number insane in this country.

Two acts passed in 1845 (5 & 8 Vict. caps. 100 and 125) have placed the powers vested in the Commissioners in Lu-
cy on an entirely new footing, and have in many respects modified the constitution of asylums. The first act repealed 2 &

3 Wm. IV. c. 107; 3 & 4 Wm. IV. c. 64; 5 & 6 Wm. IV.

c. 22; 5 & 6 Vict. c. 73; 5 Vict. c. 4; and 5 & 6 Vict. c. 87.

This first act appoints six commissioners, three of whom are physicians and three barristers, with salaries; and five other commissioners who act gratuitously. The rule that none of these shall be connected with any asylum is continued. No person can act as a commissioner who within one year has been related to a patient confined in any asylum in the county in which the commissioners are appointed; and all the commissioners are required to attend to every asylum in their county at least four times per annum.

No additions to or alterations in a licensed house can be made without the consent of the commissioners. No licence is to be granted to any person who has not given the most particular information in writing to the commissioners that he has the means of maintaining and providing for a certain number of patients, and that he has a wish to renew must give the number of patients then con-

finned. The jurisdiction of the commissioners extends to the whole of England, Middlesex, and Westminster; and to all the places within seven miles of London. Westminster, Southwark: in the county the licences are to be granted by the justices of the peace in quarter-sessions, who are bound to appoint three of their number, together with one physician, surgeon, or apothecary, as visitors of the asylums licensed by them. Strict regulations are enforced for the reception of patients; it is required that every person, not being a pauper, received as insane, shall be certified to be so by two physi-

icians or surgeons, and that such patient shall be shown to have no interest in the asylum in which such patient is to be confined; and certain entries of these particulars are to be kept at each asylum. For a pauper, the certificate of one medical practitioner is sufficient. The asylum commissioners of smaller size are to be visited by a medical attendant at defined periods, according to their size. Every house within the immediate jurisdiction of the commissioners shall be visited by them at least four times in the year, and every other house at least twice in every year; these visits may be made at any hour, even by night, and it is penal to conceal any part of a house from them. Similar powers are given to the visitors in the county.

The commissioners are to present an annual report to the lord chancellor of the state of the different asylums visited by them, which Report shall be laid before parliament.

An important innovation is in the act respecting the care of single patients. Orders and medical certificates must in future be procured for the care of one patient, similar to those used for the admission of patients into licensed houses; and certificates must be signed by one medical practitioner, and copies of all such certificates must be registered by the secretary to the commissioners. This act only extends to England and Wales, and it does not affect Scotland. The power of the commissioners to hold commissions De Lunatico Inquirendo, hereby styled specially, is commissioners, are in future to be termed 'Masters in Lunacy.'

The second act, which repeals 9 Geo. IV. c. 40, relates to the regulation of lunatic asylums for counties and boroughs, and the maintenance and care of pauper lunatics; and gives to the commissioners a great power over these institutions, which had previously been entirely under the control of justices of the peace. The justices of every county and borough are now to be compelled to erect or join in the erection of an asylum, where none such already exists; and all proposals, agreements, and plans, and the rules and regulations of each asylum, are to be submitted to the commissioners, and all contracts and estimates approved by the secretary of state. Contracts for the care of insane persons in licensed houses do not exempt any county or borough from the obligation of providing an asylum. Power is given to commissioners to employ any one of the officers of asylums; and a medical officer must be resident in every asylum which contains more than 100 patients. Lists of all the patients are to be sent twice in every year to the commissioners. The commissioners may requisition works only to England and Wales, and does not apply to Bethlehem Hospi-

tal.

Great advantage may fairly be anticipated from the restrictions imposed by these acts; and the more probably considered as steps towards the highly desirable result of making all insane persons immediately the care of the State. The duties of the commissioners have, until the last few years, been very imperfectly performed, and the utmost secrecy as to their names and movements was preserved. The manage-

ment of private asylums must vary considerably, as such houses are rarely built for the purpose, and are frequently under the direction of persons uninterested in the wants of the insane, for such an important charge; but these circumstances can by no means be admitted as excuses for the scandalous instances of cruelty and mismanagement which have gone on under the former systems of management. Public asylums, where an immense number of paupers are taken at low rates; the temptation held out in such cases to economy at the expense of the care and comfort of the patients ought to call forth an especial watchfulness on the part of the commissioners.

The patients who are confined in prisons, hospitals, work-

houses, or in the houses of their relatives, are exposed perhaps to more than to go unnoticed, and not unfrequently are treated with great cruelty, even when the intentions of the parties who have charge of them are good, through their entire ignorance of the nature and proper care of the insane, or of the disorder.

Management of Public Asylums.—There is considerable diversity in the internal regulations of different public asylums as to the power and position of the medical and non-medical
In some cases there is a resident physician who holds the superintendency of the management, and in others the physician only presides in his own department; and in others the chief officer is not medical, and the physician is non-resident. The Norfolk asylum was built in a country area, and is located far from the town. It is held without a resident medical officer; and this fact is severely commented on by the commissioners in their report.

Under the new act a resident medical officer has been appointed; but we understand that the chief authority still remains with the non-medical superintendent. In the 70th Report of the visiting justices of Hanwell (April, 1844) it is stated that they have appointed an officer in the army to act as medical officer of the asylum. The commissioners in their report place a greater order and discipline than had been maintained under medical rule; in the 72nd Report (October, 1844) the resignation of the governor is mentioned, and we cannot learn from the reports that any steps have been taken to appoint a successor, nor whether the advantages derived from his appointment equalled the expectation of the justices.

In all asylums the position of the matron is one which requires to be settled in some uniform manner, and to be free from every possible source of inconvenience to the inmates. The matron having been in many cases the wife of the superintendent, an undue influence has been given to her position; the appointment of the female attendants, and even the classification of the patients, has been in too many cases influenced by her sex and personal acquaintance, or even persons of good general information, it is manifestly improper to allow her too high an authority. In the French asylums, and we believe also in some of those in the United States, the superintendents are chosen from the experienced female attendants as heads of departments, and receive the orders of the medical officers; and this arrangement, which is found to work exceedingly well at the Salpêtrière, where there are 1500 female patients, seems on the whole to be the best. The effect of placing the matron in a higher position is almost certainly to bring about interference on her part with the duties of the medical officers, which cannot be done without arising objections. The plan proposed by Mr. Hanwell the salary of the matron is higher than that of the resident medical officers, or than that of any officer excepting the physician.

In the appointment of a chaplain, steward, secretary, accountant, and any other officers, the most important point is to confine their duties within certain proper limits, and to prevent their interference with the patients without the concurrence of the medical officers. If the government should at any time take the entire superintendence of asylums for the insane into its own hands, we trust that the mode of proceeding will be to appoint to each asylum one resident medical officer, and to leave the entire conduct of the asylum; and to whom, therefore, the power of appointing and dismissing all the subordinate officers shall belong. That a system such as this which has been a great evil in many asylums, would thus be avoided.

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It is generally admitted that the building ought not to be erected in a place farther than 10 miles from the centre of the town, and the provision for proper treatment for the middle classes. It is proposed to build an asylum in the neighbourhood of London for 300 patients, at a cost of 30,000, which sum is to be raised by contributions and subscriptions. The commissioners, however, think it will be self-supporting, and it is expected that payments of from 11 to 12s. per week for each patient will cover all the expenses. No existing asylum offers to persons able only to pay such a sum the comity to which their position in society has accustomed them.

Construction.—The site and construction of an asylum for the insane are matters of great importance. A healthy and cheerful situation should be the first consideration in an institution intended for the cure of diseased minds. In this respect some existing asylums are very well placed; Hanwell, Lincoln, and Surrey may be instanced. Others have been originally on the outskirts of towns, and have been surrounded and built in by the increase of the building. The commissioners mention several so placed in proper terms of censure.

It is generally admitted that the building ought not to be erected 10 miles from the centre of the town, and the provision for proper treatment for the middle classes. It is proposed to build an asylum in the neighbourhood of London for 300 patients, at a cost of 30,000, which sum is to be raised by contributions and subscriptions. The commissioners, however, think it will be self-supporting, and it is expected that payments of from 11 to 12s. per week for each patient will cover all the expenses. No existing asylum offers to persons able only to pay such a sum the comity to which their position in society has accustomed them.

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All疯病患者应被送入同一所医院，以便于集中管理。如果这些疯病患者居住在不同的医院里，就会产生混乱，并且需要大量的费用。在这种情况下，应该将这些疯病患者集中在一个地方，以便于集中管理。
the intervals of their fits the most intelligent of the patients, but during the fits they require great attention.

All the sick, idiots, and epileptics should be on the ground floor, which will be easily arranged, as the tranquil and moderately warm rooms which the great bulk of the patients may occupy the upper floor.

To describe the numerous minute particulars to be attended to in constructing and furnishing an asylum is unnecessary here; the general rule should be, that every possible amount of safety should be combined with every possible amount of cheerfulness. There should be the strength of a prison without its gloomy character. No part of the building, within or without, should be neglected; and scarcely a day passes without improvements being made in one asylum or other—improvements that are worthy of adoption in any to be hereafter built.

An abundant supply of warm and cold water should be secured; or in some cases it will be found that the cost of supplying this necessary article will neutralize the advantages of an otherwise favourable site.

Baths, water-closets, a store-room, and rooms for washing, are essential in every ward. Warm baths are considered by many authorities to be valuable remedial agents, as well as advantageous to the general bodily health.

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<th>s. d.</th>
<th>Cost per Patient £</th>
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Statistics.—There are in England and Wales 12 county asylums, 5 country and subscription, 11 partly charitable, 1 military, 1 naval, and 142 licensed houses; 14 of which last receive paupers. The hospital of Bethlem, which is exempt from the rules that affect other asylums, is not included to this number.

Scotland has eight public asylums; in all of which, we believe, private patients as well as paupers are received; and some are assisted by charitable endowments.

Ireland has twelve public asylums; ten of these are district asylums for the poor; Cork is locally governed, and Swift's Hospital is founded by charter.

Several new asylums are in progress both in England and Ireland.

With a view to present in a few plain statistical tables the results of treatment in each of the existing public asylums, the writer of this article sent blank forms to each superintendent in the kingdom; in almost every case they have been filled up and returned, and their contents are embodied in the following tables. When information could not be obtained in this manner or from reports, the statistical tables published by the Commissioners in Lunacy have been referred to; but these only extend to the end of the year 1843, and required much correction, as they are not upon one uniform plan. We may instance the tables furnished by Bethlem and St. Luke's as omitting many of the particulars desired by the Commissioners. In several asylums no average number of patients is given, and the per-centages of deaths and cures are calculated upon other numbers; in other asylums which have been opened many years, the early records are so incomplete as to be useless. In several asylums, even in some apparently good, the published returns do not contain any distinction of the sexes.

The First Table shows the whole number of patients admitted into the 49 public asylums of the United Kingdom to the latest date for which we can obtain information: being 58,537 males, 58,328 females, and 8304 of whom the sex is not specified. Thus the admissions of males exceed those of females by 209, or in the proportion of 1 to 9464; a scarcely appreciable difference. Of the whole number of insane persons in England and Wales on the 1st January, 1844, according to the report of the Commissioners, 9862 were males and 11,001 females; thus the females exceed the males in the proportion of 1 to 924. The greater mortality among men is the cause of this apparent discrepancy.

The following Table (II.) shows the result in the same asylums as to cures and deaths during the same period. This comparative table is recommended by the Commissioners, in addition to the tables showing the per-centages of cures and deaths on the average number.

The cure are taken as 1.

The term 'Removed' includes all discharged improved or cured, or escaped.

This table likewise shows the number remaining in the different public asylums at the latest dates to which we have been able to make up the returns, and which appears to be 5163 males, 5044 females, and 236 of whom the sex is not specified.

The greater number of cures and smaller number of deaths among females must be in a great measure ascribed to
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<td>1843</td>
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* Only for 24 years; † Only for 14 years; ‡ Only for 6 years; § Sexes not distinguished.

LIVERPOOL receive only recent cases; and in the Liverpool institution their probation is very short. The large asylums at Hauwell, Surrey, and Lancaster are consequently compelled to receive almost entirely incurables, which accounts for their small number of cures. The large number cured in the Irish asylums may be in some measure accounted for by the peculiar character of their patients. The Irish patients in English asylums usually recover rapidly, the form of disorder being frequently pure excitement, which is soon allayed by quiet, by temperance, and the orderly regulations of an asylum.

Many attempts have been made to obtain a uniform system of keeping statistical tables; at present a different plan is adopted in almost every asylum. A great improvement would be effected if every report, in addition to its information for the current year, contained a condensed statement from the opening of the institution as to admissions, cures, and deaths; and there would be little difficulty in adding the ages, forms of disease, the causes of death, and other tables. Much important information as to the most favourable and unfavourable ages, and the results of immediate and delayed admission, would be easily gathered, if a reference to the last report of any asylum were sufficient to show the experience of that institution from its opening in a condensed form. No asylum has yet published any such tables; but in the numerous new asylums which will be built in the course of a few years,
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**Mean**

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* These discharged and removed include those with the cured.

† Sexes not distinguishable.

‡ Great doubt exists as to the accuracy of the older books at the York Asylum.

§ There is some mistake here; the admissions are made to amount to 1399, and the cure, deaths, and remaining patients to 1488.

nothing could be more easy than to adopt them. The legis- lature may possibly enforce certain tables; and such a law would be exceedingly desirable, if we could hope that the practical experience of the superintendents of lunatic asylums would be allowed to be of any weight: but if the returns are to be made out according to the fancy of men ignorant of the subject upon which they legislate, the present system, by which every superintendent follows his own discretion, is far preferable.

The following points seem to deserve attention in any plan for uniform registration:

I. Admissions for the current year:
   1. Form of disease.
   2. Causes of disease.
   3. Duration of disease.
   4. Age.
   5. Age when first attacked.
   7. Station or occupation.
II. Similar returns for the whole number admitted from the opening of the asylum.
III. Cures for the current year:
   1. Form of disease.
   2. Causes of disease.

3. Duration of disease.
4. Age.
5. Age when first attacked.
6. Duration of residence.
7. Per-centages upon average number of patients.

IV. Similar returns for the whole number cured.

V. Deaths for the current year:
   1. Form of mental disease.
   2. Causes of mental disease.
   3. Duration of mental disease.
   4. Age.
   5. Age when first attacked.
   6. Duration of residence.
   7. Per-centages upon average number of patients.

VI. Similar returns for the whole number who have died.

VII. Number discharged unsecured, improved, by request of friends, removed by parishes, or escaped, during the current year, distinguishing the reasons for removal, and the duration of residence.

VIII. Similar returns for the whole number removed or escaped.

IX. Patients remaining in the asylum:
   1. Form of disease.
### TABLE III.

Per-centages of Cures upon the average Number of Patients in the Public Asylums for the Insane in the United Kingdom, for ten Years, ending 1846.

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2. Duration of disease.
3. Duration of residence.
4. Age of patients.
5. Number probably curable.
6. Number probably incurable.

The registers, to contain all this information, might be of very simple form, far less complicated than those at present in use in several asylums. The sexes should be distinguished in every statement.

Registers should likewise be kept of every instance of restraint, its nature and duration, and of the duration of every seclusion; also of employment and of the value of the work done. Many others might be suggested as useful in various ways, though not strictly necessary for statistical purposes.

Abolition of Personal Coercion.—No part of the treatment or insanity has of late years excited so much attention as the system adopted in several asylums of totally abolishing the use of all instruments of coercion, which has gained the name of the non-restraint system. We desire to preserve this name, as many asylums, which still continue to use all the ancient instruments of restraint, endeavor, by professing to practice the humane system, to lead the readers of their reports to suppose that there is no essential alteration made by the discontinuance of the use of those instruments.

In giving a slight sketch of the progress of this improvement in the mode of treating the insane, we shall consider it as a natural consequence of the progressiveamelioration in the management of asylums.

Until the establishment of Bethlem in 1847, we have little or no records of the provision made for the insane; we can only gather that all who were harmless, and many who were dangerous, supported a miserable existence by wandering and begging; those who could not be permitted to be at large were probably chained in prisons, or in the hands of their friends. Some mention is made of an asylum for insane monks established at Jerusalem in the sixteenth century, where all the rigours of monastic discipline were embodied in the treatment.

Even in Bethlem little attention seems to have been paid to the comfort or cure of the patient; the only consideration was the safety of the same part of the population. The patients were chiefly naked, and chained to the walls; and were exhibited for money, like wild beasts; and it is even said that the keepers were accustomed to allure to every subject most aggravating to the violent patient, that his rage might increase the amusement of the exhibition; while the propensities of the filthy were encouraged, and the voseous diet was kept without food, that they might appear as mere striking objects of wonder to the idle crowd. This shameful practice, by which it appears that an income of 400l. per annum was derived by the hospital, was abolished in 1770; but no improvement was made in any other respect in the treatment of the patients.

The benevolent and courageous Pinel was the first to attempt the restoration of the insane to a position among human beings. The scope of his exertions which were the great step of the non-restraint system, was the Bicêtre—hospital for insane men, near Paris. In this frightful prison the universal practice was to load patients with heavy chains,
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The table above shows the percentage of deaths in various public asylums in England and Wales from 1836 to 1846. The data is presented in a tabular format with columns for each year and rows for each asylum. The table is labeled as Table IV.
quarrelsome and violent, and the more dangerous from his great bodily strength. From his frequent excesses, he had been discharged from the corps, and he had speedily dissipated his scanty means. Disgrace and misery so depressed him that he joined the Bicêtre, a state of society in which he found no favour in general, and fought those who would not acknowledge his rank. After a furious struggle of this sort, he was brought to the Bicêtre in a state of the greatest excitement. He had now been chained for ten years, and with greater care than the others, from his having frequently broken his chains with his hands only. Once when he broke loose, he defied all his keepers to enter his cell until they had each passed under his legs; and he compelled each of these strange containers, P. N. in, his previous visits to him, regarded him as a man of original good-nature, but under excitement incessantly kept up by cruel treatment; and he had promised speedily to submit to any condition, which promise alone had made him more calm. Now he announced to him that he should be chained no longer, and to prove that he had confidence in him, and believed him to be a man capable of better things, he called upon him to assist in releasing those others who had not reason like himself; and promised, if he conducted himself well, to take him into his own service. The change was sudden and complete. No sooner was he liberated than he took a locket, published a letter knowing with his eye every motion of P. N., and executing his orders with as much address as promptness; he spoke kindly and reasonably to the other patients, and during the rest of his life, lived in his cell, and was carried by Mr. G. to various institutions to hear without emotion (says P. N.) the name of this man, who some years after this occurrence shared with me the games of my childhood, and to whom I shall always attach the same confidence.

In the next cell were three Prussian soldiers, who had been in chains for many years, but on what account no one knew. They were in general calm and indifferent, becoming animated when conversing in their own language, which was unintelligible to others. They were allowed the only consolation of which they appeared sensible, - to live together. The preparations taken to release them alternately, and at stated times, and intentionally done, as dopes were come to in new severities; and they opposed them violently when removing their irons. When released they were not willing to leave their prison, and remained in their habitual posture. Either grief or loss of intellect had rendered them indifferent to liberty.

Near to them was seen an old priest, who was possessed with the idea that he was Christ: his appearance indicated the vanity of his belief; he was grave and solemn; his smile soft, and at the same time severe, repelling all familiarity; his hair was long, and hung on each side of his face, which was pale, intelligent, and resigned. On his being once taunted for this opinion, he replied, "I am not of this breed of men," converting the Indians: his dominant idea became changed into actual mania, and on his return to France he announced himself as the Saviour. He was taken by the police before the Archbishop of Paris, by whose orders he was confined in the Bicêtre as either impious or insane. His hands and feet were loaded with heavy chains, and during twelve years he bore with exemplary patience this martyrdom and constant sarcasms. P. N. did not attempt to reason with him, but ordered him to be unchained in silence, directing at the same time that every one should imitate the old man's reserve, and never speak to him. This order was rigorously observed, and profusely on the patient a more decided effect than either chains or a dungeon; he became humiliated by this unusual isolation, and after hesitating for a long time, gradually introduced himself to the society of the other patients. From this time his notions became more just and sensible, and in less than a year he acknowledged the absurdity of his previous possession, and was dismissed from the Bicêtre.

In the course of a few days, P. N. released fifty-three men, and at the same time, that concealment is involved in the confessions and petitions of patients from all nations and countries: workmen, merchants, soldiers, lawyers, &c. The result was beyond his hopes. Tranquillity and harmony succeeded to tumult and disorder, and the whole discipline of the asylum improved. The complaint that the officers of the asylum had been embezzling the public money was stigmatised as a libel or an idle discreditable statement. The details which were brought before the committee to exhibit the brutality and profligacy of the keepers need not be repeated; but it is gratifying to find that Mr. Higgins per-
severed, notwithstanding all the obloquy heaped upon him, until a complete change of the officers and of the system was brought about.

The next asylum of which we shall have occasion to notice the management is Bethlem, concerning which we find many particulars in the evidence given before the parliamentary committee in 1815.

The severest restraint and the most cruel neglect seem to have been the almost uniform practice; and it must not be forgotten that this royal hospital, favoured with exemption from all visitation and from the effects of acts of parliament, has, been, until a very recent period, the most determined in resistance of restraint, of conserving, each patient, the indulgence of his abuse, and in closing its doors against inspection. With such large funds at command, Bethlem ought to be a model where the student of medicine may see every late improvement in the treatment of mental disorder carried into effect, without regard to the economy which has been detrimental to the improvement of many other asylums.

In 1816 Bethlem appeared to have been going back, rather than improving, for half a century. From the time that the indiscriminate visits of the public had been prohibited, the secrets of the institution were known only to a few. The case of Norris, a patient in Bethlem, which was made public by the parliamentary committee, has since been related; but it will not be out of place here. William Norris had been an officer in the navy, and was first confined at Bethlem in 1801. In 1803 he is said to have struck Mr. Haslam, the attendant, and was then dragged from him or received a new and most ingenious instrument of torture was invented for his confinement. 'A stout iron ring was riveted round his neck, from which a short chain passed to a ring attached to a bar or a chain on an upper massive iron bar, more than six feet high, inserted into the wall. Bound round his body a strong iron bar, about two inches wide, was riveted; on each side the bar was a circular projection, which was fashioned to and including each of the arms, pinned them close to his sides. The waist bar was secured by two similar bars, which, passing over his shoulders, were riveted to the waist bar both at the front and behind. The iron ring was connected to his shoulders by a double link. From each of those bars another chain passed to the ring on the upright iron bar. His right leg was chained to the trough, in which he had remained thus enclosed and enchained twelve years. He read books of all kinds, and reasoned quite coherently on the events of the war.' During the whole of this period it was impossible for him, from the nature of the restraint in which he was placed, either to stand quite upright or to lie down at ease. It will be no matter of surprise that he died on the 20th of February, 1815.

From this time a gradual but very slow improvement in the condition of patients may be observed. Chains were removed, and leathern restraints of much milder kind substituted; and more care was given to the warming and clothing of the patients. Some of the largest asylums in England were opened about this period. In 1832, the production of employment by Sir William Ellis at Wakefield, and afterwards at Hanwell, was a great advance in the amount of confidence reposed in patients; employment has since been introduced in almost every asylum, and has so far reduced the cost of the hospital, and so far reduced the cost of the hospital, that there is the charge of using the coercion of fear and of the hands for that of straps and chains. A form of coercion called 'manual detention,' wherein the attendants held violent patients quiet, was used at this time, and was employed at Hanwell. It is not known which asylum where restraint is abolished.

The experience of the Lincoln Asylum has proved every advantage arising from the non-restraint system, notwithstanding the management of the managers have been selected from some of the medical officers, by whom every kind of unfair evidence was brought forward against the system, and the crueles practised by uninstructed patients were considered as part of it.

The next asylum in which restraint was abolished was that of the county of Middlesex at Hanwell. At the time of the appointment of Dr. Conolly to the superintendence of the Asylums (June, 1836) it is stated that about eighty patients; of these about twenty were almost constantly in restraint-chairs, and a number of others were restrained, muffs, &c. In addition to these restraints, which were supposed necessary for the safety of the rest and of the officers and attendants, more than a hundred epileptic patients were fastened by one wrist in bed every night. This was considered a necessary precaution to prevent the patients from falling out of bed or turning their faces in bed, and so becoming smothered, which, it is asserted, has sometimes happened. No such case has however occurred since the disuse of the hand-slap, which took place in July, 1833.

We extract the following account of Dr. Conolly's remarks (October, 1839) from the discontinuance of restraint at Hanwell:

"The article of treatment in which the resident physician..."
has thought it expedient to depart the most widely from the previous practice of the asylum has been that which relates to the personal coercion or forcible restraint of the refractory patients. Without any intention of derogating from the high character acquired by the asylum, it appeared to him that the advantages resulting from the method of reform and systematic treatment, and customary in it at the period of his appointment was in no respect proportionable to the frequency of its application; that the objections to the restraint actually employed were very much stronger, that it could not be avoided, that it was a source of much outrages and disorders, to repress which its application was commonly deemed indispensable, and consequently directly opposed to the chief design of all treatment, the cure of the disease.\footnote{By a list of restraints appended to this report, it will be seen that the daily number in restraint was in July so reduced that there were sometimes only four, and never more than fourteen, in restraint at one time; but that since the middle of August there has not been one patient in restraint on the female side of the house, and since the 21st of September not one on either side.\footnote{The 51st report of the visiting justices, which accompanies this report, speaks of the new system as requiring an additional number of attendants, and of a superior class to those previously employed.} Among all the official reports, the visiting justices report the satisfactory results of the new system.\footnote{In the 53rd (April, 1840) they report that 'there has not been a single occurrence to weaken their confidence in the practicability of the system or the improvement of destruction of clothing or other property is occasioned by the personal freedom which the patients enjoy. Indeed, so far as clothing is concerned, the amount of destruction is somewhat lessened, because of the general tranquility of the patients from the adoption of the new system.'} In the 54th (July, 1840) and 55th (October, 1840) the justices state their increased confidence in the non-restraint system. This last report is accompanied by the second report of Dr. Conolly. During the past year a suicide (by hanging) had taken place, being the only one at Hanwell since the non-restraint system had been introduced. That restraint would not have been very available is proved by the occurrence of the suicide of a female patient in Bethlem, who hung herself in 1840 by the strings of the waistcoat in which she had been confined; and a man has since destroyed his own liberty and life, also at Bethlem, by working the waistcoat in which he was strapped down in bed so as to produce apoplexy by the pressure of a knot on the neck. The last report of the Lincoln Asylum states that not only have suicides ceased since the system of non-restraint was introduced, but that the tendency to suicide has disappeared. The latest report of Bethlem also contains an admission that restraints increase the tendency to suicide.\footnote{Dr. Conolly's report treats entirely of the management of the patients without restraint, and the substitutes for it. The marked improvement in the condition of the patients is due to improved treatment of clothing, and the substitutes for restraint are, I might say, the supporters of the old system 'solitary confinement,' which term is also improperly applied by the commissioners in their report. That solitary confinement for days and weeks together was the practice in the days of restraint is certain; for then it was a common practice to strip a patient in bed or in a restraint-chamber placed in his bed-room, and no provision for escape so great as this can scarcely now take place. Dr. Conolly says, 'All the substitutes for restraint are, like restraint itself, liable to be abused; but none can be made such instruments of cruelty by the hands of an inhuman administrator, or so capable of producing mischief, were it not for the omission of the enormity of the act, and the injustice of the proceeding. However, the statute law and the medical practice act upon the�uses in the refractory wards of a lunatic asylum.' In the sixth report (October, 1844) likewise, Dr. Conolly writes that 'It is to be regretted that in one of the institutions of observation that such a simple exclusion of irritations from an irritable mind, an exclusion not found to be necessary in more than four or five instances in any one day in the year among one thousand patients, and seldom prolonged beyond four or five hours in any of those instances, during which time the patient's state is frequently ascertainment by means of the in-}

spection-plate in the door of his room, and all his reasonable wants and wishes are attended to—should ever have been confounded with the idea of Solitary Confineinent; the latter in reality comprehending a privation of all the stimuli upon which the integrity of intellectual and physical life depends.'

The room should not be dark; the shutter which guards the window should therefore be perforated. Care should always be taken that the perforations of the shutters should not be so small as to be always entirely detached. Staff should not use,
by far the greater number of asylums which have not yet given in their adherence to non-restraint as a principle, the use of restraint forms an exception to the rule. At Dundee, no restraint has been used for two years past, and this asylum was one of those most strongly against the principle of the new system, when first introduced. The reports of Nottingham, Dorset, Montrose, Edinburgh, and Dumfries speak of the advantages of the new system and the entire relief obtain from availing themselves of it. On the contrary, the authorities of Bethlem, St. Luke's, Kent, Oxford, and the Retreat at York, profess the non-restraint system, while they practise the reverse.

The possibility and advantage of the abolition of restraint would seem sufficiently proved by the results reported in all these asylums; but a large number of persons still remain opposed to the new system, from various motives. First we must mention the unfair manner in which the subject has been noticed by the Commissioners in Lunacy; a body which had been so long paid to attend to the condition of the insane, and yet who had been proved to allow every evil to remain in the hospitals under whose care, when all others were improving, should have been the last to despise the efforts of others. Their examples of the disadvantages of non-restraint are chiefly adduced from Hanwell, and are most ably urged in a pamphlet by Mr. Serjeant Adams. Many of the cases brought forward by them as proving the necessity for restraint, are in fact strong arguments on the other side of the question. Many of the Commissioners have been most

selected, until lately, exclusively from persons ignorant of insanity, must be their excuse. The absurdities which they have allowed themselves to believe and to record, would alone suffice to prove that they have been willfully mystified by some of the medical officers of asylums.

In the Bedford, Chester, Cornwall, Exeter, Leicester, Liverpool, St. Luke's, York, and Pembroke asylums, coercion still appears to remain in force. The private asylums employ it almost without exception; these, being most immediately under the superintendence of the Commissioners, are in every respect the last to improve.

The reports of the Surrey, Wakefield, and Belfast asylums have been the most consistent opponents, both in principle and practice of the non-restraint system; one assertion in the last report of the Belfast Asylum (31st March, 1845) deserves to be quoted.

After saying that  'the same system with reference to restraint continues to be pursued in this institution,' it goes on to observe, until insanity be blotted out from the 'ills which flesh is heir to,' or altogether changed in its more striking effects, physical restraint in some form or other—but still restraint—cannot be dispensed with. Truly the so-called 'total abolition' of restraint appears to be only one of the many extraordinary and aggrandizing phrases of the present day.' It may be that there is more difficulty in the management of Irish patients without restraint than English ones; although many of the other asylums in Ireland are, upon the whole, in a better state of things; but this persistent with well-known facts, proves the writer to be ignorant of the proceedings of other asylums for nearly seven years past. Taking this into consideration, we may look with some slight upon the very curious cases subjoined, where patients request the strait-waistcoat and the muffs as favours, and promise to behave well if they are allowed the indulgence; more especially as such cases do not appear ever to be met with in asylums where restraint is entirely abolished. The absurdity of such an idea as that of a patient wishing to be put in restraint, is so monstrous as scarcely to deserve notice. As regards the negro slaves I do not believe that negro slaves are in the habit of requesting the luxury of a flaunting neck-cloth, in order to gratify their gossers to allow them the agreeable exercise of the tread-mill.

With the results before us of the treatment of many thousands of the insane by means of restraint, it is quite clear that the facts, which declared most asylums where the new system has been introduced it has been found necessary to abandon it, that the reports of all these asylums declare their general condition to be far worse since the cases are not decreased, and, which we consider of equal importance, that in the comfort of the patients curables is greatly increased, we consider ourselves justified in considering that the strait-waistcoat, the coercion-chair, and the other instruments of restraint, will shortly disappear like the 'dark house and a whip,' the straw, the starvation, the whirling-chair, and every other means of torture formerly considered a necessary part of the treatment of those who were afflicted with insanity.

('Report of the Metropolitan Commissioners in Lunacy to the Lord Chancellor,' 1844; 'Statistical Tables prepared by the Metropolitan Commissioners in Lunacy,' 1844; 'An Act for the Better Provision of Lunatic Asylums in England, Scotland, and Ireland,' (8 & 9 Vict. c. 100); 'An Act to amend the laws for the Provision and Regulation of Lunatic Asylums for Counties and Boroughs, and for the maintenance and care of Pauper Lunatics,' (8 & 9 Vict. c. 95); 'Report of the Inspectors-General of District, Local, and Private Lunatic Asylums in Ireland,' 1845; 'Returns from each District Lunatic Asylum in Ireland,' 1845; 'Reports of all the principal Asylums in England, Scotland, and Ireland, and information privately supplied by many of the subscribers; Farr 'On the Statistics of English Lunatic Asylums'; Benevolent Asylum for the Insane of the Middle Classes, Prospectus of the Asylum, and the 'Description of the Retreat near York'; Hill 'On the Management of Private Lunatic Asylums'; Browne's 'Lectures delivered before the Managers of the Montrose Lunatic Asylum'; Remarks by Mr. Serjeant Adams on the Report of the Metropolitan Commissioners in Lunacy; Personal knowledge of the Mid—sex Lunatic Asylum, Hanwell.)

The custody of the insane in Scotland is, like every other matter which demands both magisterial and executive intervention, connected with the system of local courts. The law on the subject is contained in three statutes: 56 Geo. III. c. 69; 9 Geo. IV. c. 34; and 4 & 5 Vict. c. 60. By these acts in no case can the court, without the consent of the person, or private asylum, without a warrant from the sheriff. Any person accessory to a breach of this regulation is liable to a penalty of 200l; and if he be the keeper of the asylum he is liable, besides, to the penal sanctions as defined. Yet in many cases exceeding three months' duration. The sheriff is not empowered to grant a warrant unless on the report of a qualified physician or surgeon; and the person granting such a certificate is liable to a penalty of 50l, if he has connived at an illegal report to the sheriff. The sheriff, certified by two medical men, of the state of the patient, and must notify the death or removal of the patient. In every licensed asylum a 'mental-house register' must be kept. By the act of 4 & 5 Vict. this register is appointed to be annually transmitted to the sheriff, sealed up, and the seals being broken by him, he reseals the book, and retransmits it. When a patient dies in a licensed asylum, a report must be made to the sheriff within twenty-one days by a certificate from the medical attendant, stating the nature of the disease, the length of time during which it has continued, the time when his attendance was first required, and the care of the patient and evidence of his being in the asylum open to the inspection of the sheriff. In the general case, neither the sheriff or his substitute may perform the duties of the office regarding lunatics; but it is specially provided that the sheriff is to perform all the duties as to lunatics, so far as he may be within his jurisdiction, and either he or his substitute must make a second; in these visits they are accompanied by medical inspectors. The medical bodies in Edinburgh and Glasgow elect inspectors for their respective districts; in other parts of Scotland they are chosen by the sheriffs from the qualified medical practitioners.

It is believed that the system of the management of the insane in Scotland has, both in a purely medical and in an administrative point of view, been lately vastly improved. Until a comparatively late period the statute law was nearly inoperative, from a strong natural prejudice against the enforcement of general rules. The reluctance to the treatment of the insane, and the consequent toleration for breaches of the statutory regulations. The general rule adopted in practice was, that insane persons were allowed to go at large until they had proved themselves dangerous to the lives of their neighbours, and that when confinement was in any case resorted to, the proceedings were not very rigidly investigated. It is believed that the law is now generally obeyed, and that the utility of the measure of the comfort of the patients, is felt by all who are connected with them or concerned in the administration of the law. The Commissioners in 1844 reported on the state of the poor in Scotland, did not attribute all to the reasons and which we call a slow system, by exposing the state of some private asylums in the isle of Arran where insane patients were confined in violation of the rules of the statutes.
LUTZELBURGER, or LEUTZELBURGER, Hans, called also Hans Franck, an early Swiss wood-engraver of Basel, about whom very much has been written, but as yet very little is known. He lived in the early part of the sixteenth century, and is supposed by some to have cut the blocks of the celebrated "Recueil des images de la vie de l'Enfant Jesus" of Bousquet, by Hans Holbein. This supposition, however, is founded solely on the facts of his being contemporary with Holbein and the circumstance of one of the cuts being marked H. L. This is maintained by Dr. Bell and is supported by others, especially by Kunroth in 1856, in a work entitled "Hans Holbein der Jüngere in seinem Verhältniss zum Deutschen Formenschnittwerk." (Hans Holbein the younger, in his relation to German wood-engraving.) There are many other celebrated old cuts, singly and in sets, some from drawings by Holbein, which are attributed to Leutzeler, and which are described at length in the "Künstlzeit," and in the works of Bartsch, Heisser, Mastmann, and other writers on wood-engraving. The views of all parties are stated with considerable detail in Dr. Nagler's "Neues Allgemeines Künstler-Lexicon." 

LYCIA, a genus of plants belonging to the natural order Juncaceae. It has a 1-celled 3-valved capsule, without dissepiments, with three seeds at the base of the cell. Several species of this genus have been described. L. salicifolium, the salix-leaved woodrush which grows in shady places, is one of the Great British species. L. caespitosum is common in the pastures of this country, and seven species are natives of the British Islands.

LYCHNIS (from λυχνη, a lamp), a genus of plants belonging to the order Caryophyllaceae. It has been divided into four suborders, the suborder Silene. It has a 5-toothed naked calyx; 5 petals, clawed; 10 stamens; 5 styles; the capsules 1-celled, or half 5-celled, opening at the top with five or ten teeth. The species are smooth, hairy, or coarsely hairy, with terminal corollas of flowers, rarely solitary.

L. chelidonium, the Scarlet Lychins, is a smooth clanny plant, with corolla-like flowers in bundles; the calyx cylindrical, clawed, winged; the calyx 2-, lobed, the corolla long; the leaves lanceolate, slightly cordinate at the base, and clasping the stem. This plant, which produces scarlet, roselike flowers, and white flowers, and is a great favourite in our gardens, is a native of Siberia and Japan.

Several varieties of this plant have been named. L. grandiflora is a glorious plant, the flowers solitary or terminal, terminal and axillary; the calyx terete, clavate, ribbed; the petals lacerated; corolla elongated; the leaves ovate, almost sessile. It has large beautiful scarlet flowers, and is a native of China and Japan.

L. Flous Coccii, Raggled Robin, has deeply 4-cleft petals, with a very short corolla. It has rose-coloured petals, and is an abundant plant in the moist meadows and pastures of Great Britain, as well as the whole of Europe.

L. visnaga, the Corn cockle, has the petals half-bifid, and the calyx teeth of the fertile flowers linear lanceolate, elongated; the capsule conical; the teeth erect. It is a common plant in the hedge-banks of Europe. This and the saline insipid species are frequently regarded as varieties, and then named L. dioica.

L. diurna, Red Campion, has the petals half-bifid, the calyx teeth of the fertile flower triangular, the capsule nearly globose, the teeth reflexed.

The other British species of the genus Lychins are: L. Gilia, the Corn coke, a pretty plant blossoming in cornfields from June to September; L. alpina, found on the mountains of Fortunaria; and L. Virginica, a rare plant.

Many of the foreign species are cultivated in our gardens. They thrive well in a light rich loamy soil, and may be propagated by cuttings of seeds.

LYCIA. In addition to the general description of the country in the P. C., and the geographical description of the arid table land in the "Atlas," and the "Census of the Empire" (pp. 112), we give a few particulars respecting the inhabitants and natural productions of this most interesting portion of Asia Minor.

This country is, as it seems, well inhabited, chiefly by Turks, many of whom lead a life half settled and half nomadic; they are distinguished above all other inhabitants of Asia Minor by their excellent character. Most of them are farmers, and the principal products are olive oil; grain; and cotton. Berberis Armeniaca and Greeks who live in the sea towns, form the greater portion of the population of the inland town of
Almali, which is the largest in Lycia, the population being about 25,000. Those among the Turks who wander with their herds on the high plateaus, like the Turcomans, show an independence of manners and character not very pleasant to Europeans. In the seventeenth century such a nation appears to have been a good sort of people. The Turkish population is exceedingly careless about money, and when they have enough to eat and to drink,—and they are moderate in their habits,—they are satisfied and care for nothing more. They are somewhat shy in receiving a stranger, through fear of being treated as they are by Turkish officers and the Sultan's couriers, who take away everything they please without ever paying for it. Along the coast of Lycia as well as the adjoining provinces of Caria and Pamphylia, there lives a number of Arabs, (Syrians) who are generally seamen, and seem to have settled there many centuries ago. Among the wild animals, the 'kapan,' (which term is here applied to the leopard), and the 'arslan' or lion (perhaps the panther), commit great depredations among the herds; great numbers of them are annually killed, and a reward of from 100 to 200 pisters is given by the government for each 'arslan.' They are very frequent in the district of Sidyma, on the coast. The ox is precisely the same as represented on the ancient coins and monuments of Lycia; but there is also a species of dwarf ox, of the size of a large sheep, there are great numbers of buffaloes and camels. The breeding of horses is carried on to a great extent, and herds of many hundreds are often seen grazing together in the valleys. The only kind is that of the Arabian breed, the best seen in the ancient marbles; the head is of Arabic cast, the chest is very large, the feet are remarkably fine and thin, and the ears are small, as in the antique. They are not shod. The rivers and lakes of Lycia are not frequented. 'At such a time,' the tide swarms with the green climbing frog. No part of Asia Minor contains such splendid valleys as those of the Xanthus and the Donolomen Chai: Mythre, oleander, and pomegranates cover the banks of the rivers; the plain along the river is well cultivated, and in many places the fields are enclosed by fences of myrtle and the small prickly oak, mixed with the orange, the wild olive, the pomegranate, the oleander, the elegant grape-vine, which are most beautifully matted together by vine, clematis, and many other climbers. Fruit trees are planted in enclosures. The hills are covered with large oaks and pines, which supply excellent timber, of which, however, only small quantities are shipped from the coast towns. The oak, 'quecus regios,' is a source of wealth from its acorns, the 'velans' of the Smyrna merchants, which is used in tanning leather and gives it that agreeable smell which places the Turkish leather even above the Russian 'Jacht.' A sort of horse-radiush is used as food, and as a substitute for soap. In proportion as the traveller approaches the high upland plains, the tender fruit-trees, as well as the olive, the aloe, and the myrtle, are displaced by the walnut, plum, apple, and pear trees. The high plain round Almali, which is 4000 feet above the sea, is one of the largest and best cultivated corn tracts in Asia Minor; its chief productions are wheat, corn, and grapes. Olive vines are chiefly raised in the valleys and on the coast. (Fellows, An Account of Discoveries in Lycia; A Journal written during an Excursion in Asia Minor.)

LYCOPERSICON. [Solanum, P. C.]

LYCORTAS. [Phylloxyx, P. C.; Polythys, P. C.]

LYGODYSDEEA C. E. C. D. A natural order of plants closely allied to Conchinesace. It differs from this order in possessing an ovary composed of two coniform carpels, 1-celled, with two ovules, and a single style; the pericarp brittle burst in four directions from the base, not adhering to the seeds, 1-celled; two free placenta rising up between the pericarp and the back of the seeds; two seeds pendulous from the apex of the placenta, with the embryo straight, felicitous, compressed; the radicle short, inferior. The species are twining shrubs, and have simple stipules between the petals.

This little order was constituted by Bartling, but was afterwards condemned by De Candolle, who thought there was no reason for separating it from Conchinesee. 'According to De Candolle, what Bartling calls pericarp is calyx, and his sectile monadnths are to be regarded as the most remarkable features of the order disappear, with the exception of the absence of the albumen.' (Linley,) This is a subject that merits further investigation. The only genus of this order is Lygodysdea, L. c. c. 'Two species have been described. They are both natives of Peru and Mexico.'

LYLY, LILLY, or LILLY, JOHN, was a native of the Weald of Kent. His birth has been referred to the year 1554, on the faith of the entry of his matriculation as a student at Oxford in 1571, which asserts him to have been then seventeen years old. As a lover of arts in 1572. It appears from one of his prefaces that he was rusticated from Oxford; and, after having (it is said) studied likewise at Cambridge, he went to London, and spent his life in literature, as a dramatic and miscellaneous writer. Although his writings must for a considerable time have been fashionable at court, he appears to have shared to the full in the poverty and distresses of authorship. He is supposed to have served Lord Oxford, but nothing has been ascribed of his place; and he was long and unsuccessfully an applicant for the office of master of the revels. In one of his petitions to the queen, which has been preserved, he, with melancholy quiescence, describes the history of his life as 'Lyly De Tributibus,' wherein he shall be seen patience, labours, and misfortunes.' The time of his death is unknown; but he must have survived the beginning of the seventeenth century.

The two most famous of his works bore the following titles: 'Eupheses: the Anatomy of Wit, very pleasant for all gentlemen to read, and most necessary to remember: wherein are contained the delightgs that Wit followeth in his youth by the pleasantness of love, and the advantage in his age by the perfection of Wisdome,' 4to, 1579 or 1580: 'Euphes and his England; containing his voyage and adventures, mixed with sundrie preie discourses of honest Love, as the description of a voyage on the sea of that Isle; delightful to be read, and nothing hurtful to be regarded; wherein there is small offence by lightness given to the wise, and least occasion of loosenesse professed to the ignorant.' A second edition was reprinted against Martin Marprelate: 'Pap with a Hatchet; alias, a Fig for my Godson; or Crack me this Nut; or a Country Cuff; that is, a sound Box on the Ear for the Idol Martin to hold his peace: written by one that dares call a Dog a Dog.' 1593. He was also the author of nine plays still extant: 1. 'Alexander and Campaspe,' 1584, 1591; reprinted in Dodsley's Collection, vol. ii. 2. 'Sapho and Phoe,' 1584, 1591. 3. 'Cymon and Helen,' 1580, 4to; reprinted in Jolly's Collection, vol. ii. 4. 'Galateas,' 1602. 5. 'Midas,' 1629; and 6. 'Mother Bombie,' 1564, 1567; both reprinted in Dodsley's Collection, vol. i. 7. 'The Woman in the Moon,' 1597. 8. 'The Maid's Metamorphosis,' anonymous, but generally attributed to Lyly, 1600. 9. 'Love's Metamorphosis,' 1601; the authorship of which has been doubted.

The first mentioned work of Lyly gave the name of 'Euphues' to a fashionable style of language, of which, although he certainly did not invent it, he was the most eminent literary cultivator. The Euipheus of Lyly himself was just an exaggerated form of that strained, pedantic, over-conscious style elaborated by his predecessors and exemplified by the style in general, as well as in literature about the middle of Elizabeth's reign. In his hands it added to the classical pedantry of the day a pedantry of something like science, consisting in incessant images derived from the study of half-faithful and antiquated sources. Drayton, in ascribing to Sir Philip Sidney (himself no very simple writer) the merit of having brought back the tone of language to nature, speaks of Lyly as 'Talking of stucous, sten, stations, of false, film, Playing with words and idle similies. Shakespear's Don Armado has sometimes been considered as 'parleying Euphuism,' but, as Mr. Knight has observed, 'there is a nearer approach to this jargon in much of the language used by the higher personages in the same play. The absurdities of it are buried by Jonson in his 'Cynthia's Revels.' Sir Pierce Shafton, in 'The Monastery,' is an unsuccessful attempt at reproducing the characteristics of Euphuism. Lyly's diction are almost everywhere deformed by the same false taste; yet they exhibit occasional touches of fine fancy, which however is shown to greater advantage in some of the short lyrical pieces in his 'Euphuism.' The wit of the dialogue is in some places lively. To success in portraiture of character these plays may make no claim; and as little can their mythological, pastoral, or classical tinctures be said to have been cultivated with dramatic skill. The author's claim to remembrance as a dramatist rests almost wholly on his position as one of Shakspeare's immediate predecessors; and on the fact that his plays present, in the minor characters, the antecedents of the literary tastes which prevailed in that interesting age. LYON KING AT ARMS. [Herald, P. C.]
LYSIMACHIA, a genus of plants belonging to the natural order Primulaceae. It has a 5-petalled calyx, a rotate corolla with scarcely any tube, and a 5-parted limb. The stamens are inserted at the base of the corolla, and are 5 in number. The capsules open with 5 valves.

L. thysiflora is distinguished by its axillary stalked dense racemes; the flowers are opposite and lanceolate. The corolla is divided almost to the base into narrow petals often separated by a minute tooth, which as well as the calyx is yellow spotted with orange. It is found in marshes in the north of England.

L. vulgaris has an erect stem, with compound terminal and axillary panicles, ovate or ovate-lanceolate leaves nearly sessile or 3 or 4 in a whorl. The petals are entire with glabrous toothed margins and about half their length. This species is the L. punctata of some botanists, and probably the Lonicera  in Dioecious, lib. iv. cap. 3. (F. and J. R. Synnott Plantarum Flora Classice; Babington, Manual of British Botany.)

LYTHRUM (from the Greek, 'black blood,' from the purple-coloured flowers), a genus of plants belonging to the natural order Lythraceae. It has a tubular cylindrical calyx, with from 8 to 12 teeth; from 4 to 6 of the teeth are broader than the rest and erect, the alternate ones being subulate and opposite to the petals. It has a dark and a very short style. The capsules are 2-celled and many-seeded.

L. Salicaria, Purple Loosestrife, has lanceolate leaves from a cordate base and whorled. The flowers are in whorled leafy spikes, almost sessile. It is a native of Europe, in ditches and watery places, especially about the margins of ponds and rivers, and is found in Britain very plentifully. The colour of the flowers varies from crimson to purple. The herbage is generally almost smooth, and of any green, but in dry situations it becomes hairy and downy, or in some degree hairy, as well as more dryly in stature. This species is the Lythrum salicaria, lib. xxvi. cap. 12, 4.

L. hyssopifolia has alternate lanceolate blunt leaves. The flowers are axillary and solitary, with two minute subulate bracts. The calyx teeth are all short, and the stamens are usually six in number. The flowers are small and of a light purple colour. The whole plant is glabrous, and is found in damp places in Great Britain.

L. Flavescens, Hunter's Purple Loosestrife, is a native of the East Indies. The leaves are opposite, the calyx tubular and 6-lobed, the stamens 12, and the style subulate. The petals, 6 in number, are of a very beautiful red colour, and are used for dyeing in India. The hardy perennial species of Lythrum are handsome garden-flowers; they are of many common soil, and are easily propagated by dividing at the root. The seeds of the annual kinds require to be sown in moist situations in the spring.

(Don's Gardener's Dictionary; Babington, Manual of British Botany.)

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MCRIE, THOMAS, a writer on ecclesiastical history and polemics, was born at Dunse in Berwickshire, in November, 1772. His father was a petty manufacturer and trader, who had by his industry and economy been enabled to maintain and educate, and send his only wage in quondam, a degree of independence. Dr. McCrie's parents, says his biographer, being connected with that branch of the secession usually termed Anti-Burghers, he was brought up under the ministry of the elder Mr. McTaggart, at a period when the strictness of that communion was retained in a measure which is now wholly unknown. In these circumstances he received that thoroughly religious education, of the importance of which he was ever afterwards so strenuously an advocate, and of the success of which he was himself a striking example. Having received the rudiments of education at the parish school of his native place, he afterwards studied at the University of Edinburgh, which he entered in 1788. Contemporaneously with his academical studies, he occupied himself in teaching younger lads, an employment for which he seems to have been well qualified. In 1791 he commenced his peculiarly theological studies. In 1795 he was licensed as a clergyman by the associate presbytery of Kelso, and he was immediately afterwards chosen pastor of a congregation of the same body in Edinburgh. In the earlier period of his ministry he entered warmly into those discussions naturally prevalent among bodies who have so many points of repugnation from each other as the small Presbyterian sects which had sprung from the church of Scotland. He soon commenced however the important task of studying, for the purpose of some undefined literary projects, the early history of the Presbyterian church in its connection with its most remarkable champions. The body to which he belonged followed a rule of Presbyterian discipline, from the strict tenor of which they maintained that the established church had diverged; and, recurrently perpetually to the conduct of the fathers of Presbyterianism, it was likely that any member of this body with sufficient talent would be the most zealous biographer of these primitive worthies. In 1812 he published 'The Life of John Knox.' Scholarship or literary ability were qualities which the clergy of his sect, consisting almost entirely of the humblest members of society, were never expected to display; and this first attempt, which showed both qualities in an eminent degree, accompanied by much patient research, was looked on as a literary phenomenon. In 1813 he received the degree of D.D. from the university of Edinburgh, previous to the appearance of the second edition of his work. It has since passed through several editions, and, with rapid sale, has taken its place in the literature of Scotland, and is highly esteemed by historical students. In 1819 he published a work of still more extensive and curious research, 'The Life of Andrew Melville,' a celebrated champion of Presbyterianism in the reign of James VI; and it is the indefatigable minuteness of the researches connected with this volume is scarcely matched in the English language, and it had the effect of reanimating from the most obscure materials—records of births, marriages, and deaths, ecclesiastical and proprietary registers, and like sources—the circumstances connected with the lives of some interesting men who in the stir and bustle of their own active age had failed to find commemorators. The partisan zeal with which those works were undertaken is not their least remarkable feature, and obtained from Mr. Hallam the apt designation of 'Presbyterian Histodebriatn.' There is no doubt of the accuracy with which Dr. McCrie stated facts and cited authorities, and that he was thoroughly honest; but from the beginning to the end each work is a piece of industrious and acute special pleading, and the reader whose position enables him to take an impartial view of the subject in question, will find it necessary that he knows what portions may be favourably dwelt on, and what should be hastily passed over, if not omitted. His palliations and vindications are singularly ingenious; and amid all the rude matter, the writer himself shows clearly that he knows how to give the history, he vindicates his own heroes from all follies as well as from all vices; even the destruction of the Scottish ecclesiastical buildings has its meed of praise. Written in a style admirably adapted to its subject, and by men in pursuit of it, they are very popular with the ultra-Presbyterian party in Scotland. Their author led a blameless simple life, on a small salary, which, with the free use of the valuable public libraries in Edinburgh, contented his unremunerative disposition. He died on the 6th August, 1836, deeply lamented by the members of his congregation and a wide circle of private friends.

(Life of Thomas McCrie, D.D., by his son, the Rev. Thomas McCrie.)

MCULLOCH, DA. JOHN, was born in Guernsey, on the 6th of October, 1773. He was descended from an ancient Scottish family, the MacCullochs of Nether Ardwall, in Kirkcudbrightshire, a younger branch of the MacCullochs of Myretoun, a family which at one time possessed considerable property in Galloway. He was the third son of James MacCulloch, Esq., and Elizabeth, daughter of Thomas De Lisle, Esq., one of the jurats of the royal court of Guernsey. In his childhood Dr. MacCulloch was very thoughtful, and fond of being alone. He taught himself to write, and wrote Latin exercises at an age when many children have barely acquired a knowledge of the alphabet. He seldom played with other children, but when the hours of study were over was in the habit of going into a room which his father, who was a man of scientific and literary attainments and a good mechanic, allowed him to call his own, and the door of which he contrived to fasten with a large bent needle in such a manner as to prevent his brothers entering. Here he amused himself with drawing, carving various articles in wood and cocoa-nut shell, and, at a very early age, in attempts to make gunpowder, and, after he had effected that, in manufactominig fire-works. His family was at this time residing in Cornwall, and the first school he was sent to was the grammar-school at Plympton. He was afterwards removed to one at Penzance; and thence, in 1787, to the grammar-school at Lostwithiel, where he remained three years, and where his talents seem to have been appreciated by the master, Mr. McGilvery, of whom Dr. MacCulloch always spoke with the greatest respect and love.

In 1790 he went to prosecute his medical studies at Edinburgh, where he obtained his diploma of physician, at the age of eighteen. He subsequently entered the artillery as assistant-surgeon, and on the 6th of April, 1802, accepted the situation of chemist to the Board of Ordinance. In 1807 he resided at Blackheath, where he practised as a physician. His application while pursuing his studies at Edinburgh was intense, and probably received an additional stimulus from the circumstance that his father, who was settled as a merchant in Bretagne, was arrested at the beginning of the French revolution, and it is this that caused the idea of the history of the Reign of Terror, a state of things which naturally put a stop to the lucrative business in which he was at that time embarked. During Dr. MacCulloch's occasional visits to Penzance, while he was in the same business, he went to the Boscobel, retired, and became acquainted with Sir Humphry Davy, who was indebted to him for some of his earliest instruction in chemistry.

About the year 1811 he was engaged by government to make various surveys in Scotland. He in consequence gave up his practice, which he never regularly resumed, although he was frequently consulted. The first business on which he was employed in Scotland, was in a search for stones adapted to the use of the government powder-mills. The second was an examination of the principal mountains, with a view to the repetition of the experiments which had been made at Edinburgh on the density of the earth. The third had for its object the correction of the deviations of the plumb-line on the meridian of the trigonometrical survey. Whilst he was making these surveys, he also employed himself in geological researches, and in furnishing materials on the manufacture of the new public work in which he was employed - the mineralogical and geological survey of Scotland, which was continued every summer from 1829 to 1832, when he completed it. The winters of these years were spent in literary and scientific work, putting in order the observations made in the summer, in
drawing sections, and preparing the map. This great work, precise and exact as it is, the labour of one individual, begun, carried on, and completed by himself alone, extending over a country richer in its variety of rocks than any country of equal extent in the world, and under all the difficulties it has never been surpassed, or even equalled, by any undertaking of a similar nature. In making this survey Dr. MacCulloch had to contend with many hardships, for great part of the whole surveys were made in the most desolate and miserably poor comfortless land. It was his lot to do all the different works provided for in all other surveys by half a dozen men and as many salaries. As a proof of the aptitude which he possessed for the surveying business, we may mention that he steered his own boat through the dangerous channels of the Scottish islands.

Some of the fruits of these separate surveys are published. The first publication was 'A Description of the Western Islands of Scotland, including the Isle of Man, &c.,' 2 vols. 8vo., with 1 vol. 4to. of plates, London and Edinburgh, 1831. Next, 'A Geological Classification of Rocks with Descriptive Synopses, comprising the Elements of Practical Geology,' London, 1831, 1 vol. 8vo. Thirdly, 'The Highlands and Western Isles of Scotland, in a series of Letters to Sir Walter Scott,' London, 1834, 2 vols. 8vo. This work, in addition to a most graphic description of the country, contains many learned dissertations on the history, antiquities, language, music, and economy of the Highlands. Fourthly, A Synopsis of Geology, containing a Plan of the Investigation of the Connection with the Sacred Records,' London, 1831, 2 vols. 8vo. In 1832 he published a 'Treatise on the Art of Making Wines,' which reached a fourth edition in 1838, and in 1839 he published an account of the travels of Blair and Dunkeld, forming a guide-book to those localities. He contributed many papers both to the Encyclopedia Britannica and to Brande's Journal, on various subjects connected with Scotland generally, or its rocks and minerals; besides others on different topics. One of these is a description of twenty-two species of Muscidae found about Shetland and Orkney; so attentive was he to everything that surrounded him. His published writings filled four quarto volumes. He was a member of the 'Social and Medical Society,' and wrote frequently in the Edinburgh, Westminster, and Quarterly Reviews, and in the London and New Monthly Magazines.

Although unable to follow up the practice of his profession, Dr. MacCulloch never lost sight of it, the proofs of which we have in two elaborate works which appeared in 1827 and 1828. The first is entitled 'Malaria, an Essay on the Production and Propagation of this Poison, and on the Nature and Localities of the Places by which it is produced,' &c., 1 vol. 8vo., London. The second is 'An Essay on the Remittent and Intermittent Diseases, including generally Marsh Fever and Nervous Fevers, in which the first who referred a large list of disorders, hitherto deemed anomalous, and which appear to have nothing in common with one another, to their true source—the poison of the malaria.'

In his latter publications Dr. MacCulloch contains important notices of the fact that they must have resulted from deep thought, based on an intimate knowledge of the subjects he treated of. The acquisition of this knowledge was gained by intense study, aided by a wonderfully retentive memory. The variety of his acquirements was not less remarkable than their extent. Allusion has been already made to his knowledge of medicine, geology, mineralogy, chemistry, and mathematics. He was also well acquainted with theology, astronomy, zoology, botany, physics, and the mechanical arts. He was skilled in architecture. He drew well, and has left an immense number of drawings. He was an accomplished musician. He was a proficient in the cith, the harp, and the violin; and yet he was conversant with the theory as well as the practice of the science. His accomplishments, as they are called, were cultivated at times which many persons pass without employment. His entertainments were done while others were employed in walking or riding. His flowers and herbs were examined, dried, and painted before breakfast in the long summer mornings. When he used to practice music, he did so during the days of the most of his employment; and yet he was not less proficient than his contemporaries. The magnitude of his labours appears still more remarkable from the fact, that for many years he was afflicted most severely by the effects of malaria.

In 1804, Dr. MacCulloch received 'Proofs and Illustrations of the Attributes of God, from the Facts and Laws of the Physical Universe; being the Foundation of Natural and Revealed Religion.' It was intended for publication in the following year; but its appearance was delayed by the announcement of the Bridgewater Treatises. In obedience to his last will, it was published in 1837, in 3 vols. 8vo. Many papers on various subjects remain unpublished, and among them a corrected copy, with numerous additions, of his work on the Highlands of Scotland. Dr. MacCulloch was fellow of the Royal, Linnean, and Geological Societies, and at one time vice-president of the last. In 1830 he was appointed physician in ordinary to Prince Leopold of Saxe-Coburg. For some years, and till his death, he filled the situation of lecturer on chemistry and geology at the East India Company's Military Establishment at Addiscombe.

He married, in the summer of 1835, Miss White. He was with her in Cornwall, on a visit to an old friend, when the accident occurred which led to his death on the 21st of August, 1836. He was thrown out of a pony phaeton, by which, in addition to other injuries, his right leg was so shattered that amputation became necessary. He only survived the operation a few hours. He was buried in the churchyard of Guiting, a village near Penzance, in which his family had at one time resided.

Dr. MacCulloch was steady in his attachments, zealous to promote the interests of his friends, and ever ready to aid those who needed his assistance. He possessed very strong affections and acute sensibility, which for so many years seemed rather to have increased than diminished. His manners were courteous; his conversation was rich, varied, apparently exhaustive. He excluded others, and remarkable for its unaffected simplicity. He was as willing to impart information as he was eager to acquire it.

(Principally from the Annual Biogrophy and Obituary for 1836.)

MACDONALD, ANDREW, an unfortunate man of letters, furnishes the theme for one of the most affecting passages in D'Israeli's 'Cautities of Authors.' He was born about 1755, and was the son of a gardener in Leith. After having been educated in the University of Edinburgh, he took orders in the Scottish episcopal church, and in 1777 became pastor of a congregation in the 'New Meeting House,' on the 29th November 1778, a Poetical Fragment,' in Spenser's stanza. This volume was succeeded by a novel called 'The Independent;' and afterwards a tragedy of his, called 'Vimonda,' was played with success in the theatre of Edinburgh, with a prologue written by Henry Mackenzie. Becoming tired of a charge very ill remunerated, and being encouraged by the reception of his play, he resigned his place, and came to Edinburgh; first however marrying the servant-maid of the house he had lodged in, and then living for a short time very extravagantly. He next removed to London, where, in 1787, his tragedy was brought to the stage by Mrs. Siddons with much pomp and very considerable approbation. But the success was short, and he in 1788 he died in London, leaving his wife and child in beggary. A volume of his sermons was published in 1790; and a volume of poems, including 'Vimonda,' was published at this time, appeared in 1791. His dramatic genius cannot be rated high; but he possessed no considerable power both of poetical fancy and of expression. There is a good deal of vigour in some of his light poems, written in London, in the manner of Peter Pindar.

MACDONALD, ETIENNE JACQUES JOSEPH ALEXANDRE, Duke of Tarentum and Marshal of France, was born on the 17th Sept., 1765, at Sancerre in the department of Cher, though some authorities make Sceaux the place of his birth. He was descended from a Scotch family, which, on account of its participation in the revolutions of 1745, was compelled to take refuge in France. He entered the army as a lieutenant in the regiment of Maillebois, and afterwards joined the regiment of Dillon, chiefly composed of Scotch and Irish, in the French service. He was induced, it is said, to remain in France at the breaking out of the Revolution, on account of his attachment to the daughter of Mons. Jacob, who warmly exposed the republican cause. His military talents procured him a place at the commence- ment of the campaign of the army of the General Dumouriez, and he rose to the rank of Captain after the battle of Jemappé; some biographers however state that his valor on that occasion was rewarded with the rank of Colonel. He served in the campaign of the last campaign, and distinguished himself by the passage of the Waal on the ice, under a severe fire from the batteries of Nimeguen, by which exploit the Dutch fleet was captured. Having risen to the rank of General of Division, he succeeded in 1796
at Düsseldorf and Cologne. He then joined the army of the Rhine, and afterwards that of Italy; and when in 1798 the French became masters of Rome, Macdonald was appointed governor of it. His abilities and new capacity appear to have been marked by some severities, but his position was one of extreme difficulty. On the approach of General Mack he was obliged to abandon Rome, and his army was compelled to retreat. The Austrians, however, were defeated, and he was enabled to regain possession of Rome. He was afterwards sent by the French government in their enterprise against the kingdom of Naples, and with a large force he invaded the country. Before the superior force of Suworow, he saved his army, and reconducted it to France by a retreat in which he displayed considerable skill. (Suvorov, 2, C.)

Macdonald had command at Versailles during the period of the revolution of the 18th Brumaire. (Bonaparte, P. C.) In 1800 he was appointed commander-in-chief of the army of reserve in Switzerland. His celebrated passage of the Splugen, the difficulties and difficulties which he surmounted, the persevering ability which he displayed, have rendered his name greatly celebrated in the annals of warfare. There are indeed but two events recorded in history to which this memorable exploit can be compared—the passage of Hannibal over the Alps, and that of Napoleon over the Great St. Bernard. Alison, in an elaborate comparison which he makes between the latter and that of Macdonald, considers that this general had greater difficulties than Hannibal had to surmount, while he had less means at his command to surmount them. (Alison, Hist. of Europe, c. xlix.)

In March, 1802, he was appointed French ambassador at the court of Rome, and on his return to Paris he was created Grand Officer of the Legion of Honour. He afterwards remained some years without employment, on account of the free expression of his sentiments with respect to the conduct of the First French Republic toward General Moreau. (Bonaparte, P. C.; Moreau, P. C.) It was not until the year 1809 that he was recalled to military service, when the command of a division of the army of Italy under Eugene Beauharnais was given to him by the Emperor. Macdonald on this occasion made noble use of the opportunity of renewing his military reputation. The troops under his orders entered Styria; he compelled the Austrian general Meerefeld to capitulate at Laybach (May 22, 1809); and he shared the glories of the victory of Raab. He was present on the 6th July at the famous battle of Wagram; the important duty of forcing the enemy's centre, which was defended by two hundred pieces of cannon, was committed to him, and he executed this critical movement with the most consummate skill and bravery, but with immense loss. On the morning after this great victory, the French were re-renewing the assault when Napoleon passed through the army. Macdonald, stopped, and, holding out his hand as a pledge of their reconciliation, paid him a just tribute of praise for his share in the victory, and as an earnest of his admiration pronounced Marshal Ney's name, as that of a soldier's soldier. The victory was such that two other marshals were created for their distinguished services, Marmont and Oudinot, who afterwards obtained the respective titles of dukes of Ragusa and Reggio. It is also added that Macdonald with affectionate gratitude for the honour conferred, especially for the manner in which it was conferred, pledged himself to abide by the destinies of Napoleon for life or death.

He was afterwards appointed governor of Gratz, where by the strict discipline he maintained among his troops he so conciliated the esteem of the inhabitants, that on his leaving the town they begged his acceptance of a most valuable gift of jewellery, which he refused. On his return to Paris in 1811, he was about to be married. This gift however nobly refused, and added that the best proof of their gratitude towards him would be shown by their care of three hundred sick soldiers, of whom he had charge. (Bonaparte, P. C.) He never add to his military reputation. On one occasion indeed he was engaged in an enterprise which has tarnished the glory of his previous exploits. After the fall of Tornion (March 29, 1814), where he was engaged in the repulse of a Russian detachment by the circuitous route of Maurens. He was attacked on his march by the Spanish general Sanfield, and his troops met with a determined opposition on the bridge of Manresa; this obstacle overcome, the French, or rather the Italians in the French service, forced their way through the town, whose inhabitants offered them no resistance, and they wreaked their vengeance upon it by setting fire to its buildings. Seven hundred Frenchmen perished in this attack on St. Helena, and it is to be regretted that Macdonald, who witnessed the configuration, made no efforts to put a stop to it, and offered no assistance to the sufferers. This unnecessary cruelty was conveyed to the Emperor, who was indignant at it, and attributed it to all its vigour that guerrilla warfare which proved so harassing in its effects and so important in its ultimate results.

In 1812 Macdonald accompanied Napoleon in the expedition to Russia. He was ordered to precede the main army under Suvorow, to attack and envelop Marshal Blücher, who was at the head of an army very superior in numbers to his own, which was impudently scattered over a space of thirty miles from Liegnitz to Silesien; so that when attacked on his centre and his left by the concentrated masses of the Prussians, he had no adequate force at hand to arrest the onset of the enemy. The result of this engagement was the loss of one of his divisions, that commanded by Pothu, one hundred officers, including Pothu himself and all his staff. Three thousand soldiers became prisoners; twelve pieces of artillery also fell into the hands of the enemy. At the great and disastrous battle of Leipzig, in which Marshal Ney was killed, Macdonald was enabled to swim safely across the Elster. (Poniatowsky, P. C.)

In 1814 Marshal Macdonald faithfully redeemed the pledge of the court of Napoleon on the field of Wagram, and constantly adhered to his declining fortune; he also warmly exerted himself with the allies to obtain favourable terms for the emperor and his family. He was with him at Fontainebleau (Bonaparte, P. C.). Napoleon expressed to him his regret at not having before appreciated his value, and presented him with a splendid Turkish sword, the gift of Abraham Bey.

On the first restoration of the Bourbons, he was called to the chamber of peers, where he proposed several measures of justice towards the returned emigres and the veterans of Napoleon's army. These just and expeditious proposals were however rejected.

When his former chief returned from Elba, this marshal was solicited to accept a command which his loyalty refused. He proceeded to Lyon to join the Count d'Artois, afterwards Charles X, and endeavoured, though fruitlessly, to induce the troops to remain faithful to the Bourbon cause. On his failure he returned to Paris, and when Napoleon approached the capital he was appointed to the command of the royal guard. (Poniatowsky, P. C.)

On the 20th March, 1815, the marshal of the Bourbons was named chancellor of the Legion of Honour (Legion of Honour, P. C. S.), which office he retained till 1831. He likewise received the appointment of governor of the twenty-first military division, and that of major-general of the Royal Guard. The rest of Macdonald's life appears to have been chiefly passed in tranquil occupations on his estates. He visited Scotland, where he showed much kindness to some relatives whom he found in the Highlands in humble circumstances. He died at Paris on 24th September, 1840.

Marshal Macdonald, though not the most distinguished of Napoleon's generals for his military service, has not been surpassed by any in his constancy, integrity, interestlessness, and in the maintenance of honourable principles. His highest praise is perhaps to be found in the brief but expressive remark made concerning him by Napoleon at St. Helena: 'Marshal Macdonald was a man of great loyalty.' (Alison, Hist. of Europe, vols. ii. iv. and ix.; Court and Camp of Napoleon; Las Cases, Mémoires de St. Hilaire; Dict. Hist. des Batallies; Biographie Moderne, Paris, 1815; Macdonald, Histoire de l'Armée, 1813.)

MACER, AEMILIUS, a Roman juris, who lived under the Emperor Alexander Severus, or shortly after his time. He was either a contemporary of Ulpian, or wrote after him. He was born at Ulpianus, the son of a man of the same name. He was a lawyer, and one of the legal writers, and his commentaries are in the Digest of Justinian. He is also known of the Digests of all the important cases. He was a member of the Roman Senate, and was a writer on public and private jurisdiction. He was also a writer on public and private jurisdiction.
and two on Appellations. According to Priscian he also wrote Annales.

MACHINERY. It is proposed to consider in this article the influence which is exercised by machinery upon the general interests of mankind, and especially upon the well-being of the laboring classes. There is no subject in the present age which is more deserving of investigation; and none perhaps in which all classes are so much concerned. Whatever theoretical opinions may be entertained by speculation upon points to point of detail, the laboring man, upon whom, as a content, instead of it, is rapidly increasing and cannot be restrained; it is right therefore for all men to endeavour to judge for themselves in what manner it is valuable to society, and to decide who are its real beneficiaries.

By some, every new machine is viewed as an addition to the wealth and resources of a country; by others it is regarded as a hateful rival of human industry—as iron contending with straining steams—as steam struggling against the life and blood of man. The one view is full of hope and promise; the other is fraught with gloom and sadness. One would present society advancing in wealth and comfort; the other would show it descending faster and faster into wretchedness. But even those who believe that the inventive faculties of men have been engaged in devising for themselves a curse, would gladly be convinced that cheerful anticipations of good are consistent with sound philosophy.

The influence of machinery is of two kinds: 1st, as it affects the production and consumption of commodities; and 2ndly, as it affects the employment of labour.

As to the first condition of machinery, it has been well described to be the same as if every man among us had become suddenly much stronger and more industrious. (Results of Machinery, 7th ed., p. 36.) If, by the aid of machinery, ten men can perform the work of twenty, and perfect it better and more quickly, the products of their labour are as much increased as if they had really become suddenly much stronger and more industrious; and, it may be added, more skilful. Thus production, which is the object of all labour, is more abundant; and society enjoys the results of industry at a less cost. Who can doubt that this is a great benefit, unless it be attended with evils which are not at first perceptible? No man labours more than is necessary to effect his object; and his constant desire is to contrive modes of saving his own physical exertions. A rich soil and a fine climate are universally esteemed as blessings because the people enjoy abundance with comparatively little labour. A poor soil and climate are evils, because the husbandman must labour much though the produce of his industry be small.

Labour without adequate results is always regarded as a curse, and almost every human invention, from the earliest times, has had for its objects the saving of labour and the increase of production. Horses and other beasts of burden were man's first attempt to economise his labour; the cogs that must have borne themselves; to draw the plough which otherwise their own strength must have forced through the soil. To the same object all nature has been made subservient. The strength of animals is made use of by them in proportion as the wind performs the same office. A boat is built to save men the labour of carrying their goods to a distance, and it is less labour to row the boat than to carry its cargo: but rowing is laborious, and sails were invented that the wind should do the work of man. In all other matters it has been the same. Man is weak in body, and ill endowed by nature with the means of self-preservation and subsistence. Many animals are stronger and more skilful; they are more active than himself: they can pursue their prey with more certainty, they are armed with weapons of offence and defence, and they need no shelter from the weather but that which nature has provided; their own strength need not be exerted in self-preservation. But man was created naked and defenceless. To live he must invent, and reason was given to him that he might force all nature into his service. His teeth and nails were made of his own body to enable him to eat, and keep his bones from his body. The wants of his hands were formed with wonderful aptitude for executing the tasks which reason set him. He invented tools and implements and weapons, and all nature became his slave. He was no more able to overcome the obstacles in his way as if he had become stronger and more industrious. He produced more for his own comfort and subsistence, with little labour, than the greatest exertions could otherwise have obtained for him. The world had become more productive: but that is the most perfect invention which attains this object the most effectually. Can any one doubt the advantage of abundant production? It needs but a few men to produce what otherwise might be done by a hundred, or a thousand. The world will be a better place for good; we are not satisfied with the enjoyment of the common necessary of life; we all desire comforts, luxuries, and ornament; and in proportion as we desire them we become more civilized. The more we desire and are able to enjoy, the more happily it has its vices, its follies, and its absurdities; but it seems the law of our nature to advance to that state, and with the increase of artificial wants our intellect becomes more active and enlightened, refinement of manners succeeds to barbarism, and all those moral qualities for which man is distinguished, become developed. We may conceive some Utopia in which all the noble parts of man's nature are cultivated, while his wants remain simple and easily satisfied, but the world we live in presents another picture. We might wish it were otherwise; but it is in vain to deny that refinement is the accomplishment and, in some degree, the consequence of riches, and benevolence the condition of those people who have not been elevated by the increase of wealth. It follows therefore that to multiply the objects of comfort and enjoyment which human industry can produce, is to improve the moral and intellectual being, and to minister to their enjoyment of life. It is quite consistent to deprecate the vices and follies which are ever associated with our craving for new possessions, while we observe the benefits resulting from it. Throughout the world good and evil are found side by side; but the good, as we would fan believe, preponderates.

When once it is admitted that men are to be described as housed and clothed, and are as nearly as possible equipped with the things necessary for the enjoyment of life, and are content with them, there would be no poverty, and infinitely less vice. Machinery, by diminishing the amount of labour required for the production of commodities, lowers their price and renders them more universally accessible to all classes of society. Working-men no longer toil for the rich alone, but they participate in the results of their own industry. If they desire such luxuries "purple and fine linen" are not beyond their reach; and their dwellings are more commodious and often more elegant than were the houses of the rich three centuries ago. If this increased facility of acquiring the comforts of life has been frequently complained of, it is because men have not sufficiently understood that the beneficial results of machinery would have been conspicuously shown by the improved condition of all the working classes of this country; but more money has been squandered on the wars of the nation than would have sufficed to place themselves and their children beyond the reach of want.* Cheap production is more beneficial to the poor than to the rich. The rich man is certain of gratifying most of his wants, but the poor man is constantly obliged to forgo one enjoyment in order to obtain another. If his shoes or his coat be worn out, his dinner must be stinted perhaps until he can pay for a fresh supply; and thus, unless his wages be reduced, and his position not raised, the benefits of the new condition of things are not enjoyed as much as had been expected. The money which he saves in the purchase of one cheap article is laid out upon another, and the same effect of expenditure is produced. The man who is in debt has no custom made imperious. In short, he is no longer poor.

These facts are undeniable; but it is alleged that machinery not only makes articles abundant and cheap, but multiplies articles to such an extent that there is no room for the consumption of all that is produced. Every new machine operated by steam brings ruin and misery upon the working classes. For reasons explained elsewhere (Demand and Supply, P. C. S.) a universal glut of all commodities is impossible; the more men produce, the more they have to offer in exchange; and for

* The amount spent annually upon spirits is equal to the interest of the national debt; and the amount spent in the United States in the purchase of foreign luxuries is estimated at considerably more than the entire capital of the United States. Six millions a year are annually sent abroad in foreign purchases. It is supposed that some idea may be formed of the property of the sequestering classes of the present day, if it be considered a band preserving an allowance of thirty dollars beyond the wages for ten labourers.
wants are only limited by their means of purchasing. But particular commodities are frequently produced in excess, and a glut of the market ensues. In causing such gluts machinery is a powerful agent, but only in the same manner as all labour would be, if applied in excess. The results would be precisely the same as with all other commodities. They would produce more than there was a demand for, and their goods would fall in value or be unsaleable. Commodities produced by machinery are subject to the same laws as govern all other commodities. If the supply of them exceed the demand, they are depreciated in value; but the power of producing with facility does not necessitate an excess of production. It must be supplied with caution, and its use be properly learned by experience. Suppose that the soil of any isolated country were extraordinarily fertile and the population very small; but that without considering these circumstances the people were determined to cultivate the whole of their land and bestow upon it all their skill and labour. An excess of food would be the result—more than could be eaten within the year; much would be wasted or sold without profit, and much laid up in store for another season. The husbandsmen would be disappointed at the unfortunate result of their industry, but would they complain of the fertility of the soil? It would not be the soil that had caused the evil, but the one's misused energies; and again it is with machinery, which like a fertile soil gives forth abundance: its capabilities are known and its advantages ought to be appreciated; but if its productivity be brought into practice it gives rise to a glut. It is important also to note the influence of machinery upon the production and consumption of commodities need not be followed any further. It increases the common stock of wealth in the world and is capable of extending the means of human enjoyment. But these benefits will be neutralized if, while it increases production, it has a tendency to diminish the means of employment for the people and the wages of labour; and this could be second only to the loss of the use of machinery. 

The invention of a machine which should immediately do the work of many men employed in a particular trade would certainly, in the first instance, diminish employment in that trade; but it might be turned out of employment in other trades, and much individual suffering would be occasioned. There have been frequent instances of such a result, and as far as the immediate interests of the particular sufferers are concerned, it is an evil which cannot be too much lamented. In their case machinery is like a rival bidding against their labour, and is as injurious to them as if a fresh set of workmen had supplanted them in the service of their employer. But great as this evil is (and we would not underrate it) it is of comparatively rare occurrence and of short duration. If the invention of the machine caused no more production than the labourers had previously accomplished, the labour of a certain number of men would be permanently displaced: but as an equal quantity of goods is produced at a less cost of labour, their price is reduced and their consumption consequently increased. An increase of employment with an increased population is thus assured for; and more workmen are again required in the trade. In this manner the demand for increased production corrects the tendency which machinery would otherwise have to displace labour permanently. Even the temporary displacement which frequently occurs is less extensive than might be supposed. Machines are rarely invented which at once dispense with many workmen. They are at first imperfect, and of limited power; they make the labour of the workmen more efficient; but do not become substitutes for labour. Thus, even if the demand for commodities were not increased, the displacement of labour would be very limited and deferred to a distant period. The increased productivity and increased demand for increased machinery in every successive improvement in machinery, it will be found, practically, that more operatives are employed in every branch of manufacture, after the introduction of improved machinery than before it began.

Of this fact we shall offer some examples presently; but here it may be necessary to allude to the case of the handloom weavers, which is constantly adduced in proof of the supposed wage-earning capacity of machinery. The case is scarcely overstated, nor can it be denied that it has been caused by machinery: but it must be recollected that while they have rarely contended against machinery—like pigeons against hawks—they have not met in thousands of hostile classes, unskilled and accustomed to the labour of operatives, have gained a profitable employment by working with it, in the same trade as themselves. No one can suppose that the labour of the hands could compete with the power of steam, and the real cause of their distress is, that instead of adapting the form of their industry to the altered circumstances of their trade, they have continued to work, like an Indian caste, with the same rude implements which their fathers used before them. Their case has not been the same as that of the millers who should persist in grinding corn by hand, while his neighbours were building mills upon a rapid stream which ran beside his garden. His own ignorance or obstinacy, and not the stream, would be the cause of the failure of his agricultural operations. If the case of the handloom weavers be adduced as an example of the permanent displacement of labour by machinery, it is only because if it is the result of the application of machinery to diminish employment in other trades in the same manner we must necessarily infer that wherever machinery has been largely introduced into any trade, the number of persons supported by it must have been diminished. We should infer that the agricultural population of this country must have been rapidly increasing, while the population engaged in those branches of manufacture in which steam-power is used must have been falling off or increasing less rapidly. The correctness of such an inference may be estimated from the following facts:

In no trades has machinery been so extensively introduced as in the manufacturing of cotton and silk, and nowhere has the population increased so rapidly as in the principal seats of such manufactures. Between 1801 and 1841, Manchester increased in population from 90,866 to 293,185, or 202 per cent.; Stockport from 26,707 to 78,275, or 194 per cent.; and Oldham from 21,412 to 56,935, or 167 per cent. (by the cotton trade) increased, in the same period, from 75,722 to 264,298, or 221 per cent.; Leeds, from 53,162 to 161,874, or 148 per cent.; Bradford (York), from 6898 to 42,646, or 517 per cent.; Beverley from 3457 to 46,123, or 1387 per cent.; Huddersfield, from 7268 to 25,065, or 2443 per cent.; Manchester, from 8743 to 24,173, or 176 per cent.; and Dukinfield from 1737 to 22,384, or 1190 per cent. In Scotland the same result is shown in the increase of the use of machinery. Between 1801 and 1841 Glasgow increased from 77,885 to 274,533, or 254 per cent.; Paisley, from 31,179 to 80,487, or 164 per cent.; and Greenock, from 17,486 to 82,611, or 367 per cent.

Thus far of the manufacture of cotton, wool, and silk. The seats of the iron and hardware trades exhibit similar results. In the same period of forty years Birmingham increased from 78,670 to 190,549, or 155 per cent.; Sheffield, from 31,814 to 65,188, or 117 per cent.; Wolverhampton, from 12,665 to 36,383, or 189 per cent.; Matlock Tydvil, from 7705 to 94,947, or 1203 per cent.; and West Bromwich from 6087 to 26,121, or 328 per cent.

In this extraordinar y ratio has the population increased in the seats of our staple manufactures, which by the aid of machinery have supplied the world with articles wrought by the industry of other people. Let us take as a parallel the places with those agricultural counties in which machinery has exercised the least influence, and let us see if the absence of machinery is equivalent to a slow and stagnating growing population. In the same period, between 1801 and 1841, Devon increased 55.3 per cent.; Somerset, 59 per cent.; Norfolk, 50.5; Lincoln, 75.9; Essex, 53; and Suffork, 49.5 per cent. The average increase of these six agricultural counties did not exceed 50 per cent. in forty years; while, setting aside the extraordinary increase exhibited in the particular towns already enumerated, the population of six manufacturing counties, viz. Lancaster, Middlesbrough, York, W. R., Stafford, Chester, and Durham, including all the agricultural, increased 112.5 per cent.

These facts prove conclusively that machinery, so far from diminishing the employable power of the people, has, on the contrary, considerably increased it. Mere habit of trade is an important qualification in this respect. 

It has been shown that machinery has had a beneficial influence upon the employment of labour in the particular trades in which it is used, increases it in an extraordinary degree. And not only does it give employment to larger numbers of persons, but their wages are considerably higher. We shall not attempt to compare the increments of capital and labour with that of operatives engaged in the infinite variety of trades carried on in manufacturing towns, in connexion with machinery, but it is enough to ask, whence has come the increased productive power of the nation? The answer is to be seen in the large increase which has been comparatively insignificant if thousands had not been transferred to the towns from other places. And what could have induced them to leave their homes and engage in new trades if the employment offered by more certain employment and higher wages? It is clear to all who have observed the progress of business in different parts of the country that the great increase of numbers employed in the manufacturing districts is simply an error in the account books of the employers, and that the real cause of the increase of population is the increase of the purchasing power of that class of the community which is the most productive and which is the most entitled to demand and to receive an increase of wages for the services which they render to society.
In which it has been used, and it now remains to consider its effects upon the employment of labour in other trades. In the first place, a few of its obvious results may be noticed. For example, the manufacture and repair of machinery alone gives employment, directly and indirectly, to vast numbers of persons who are engaged in the employment of labour in the similar trades in which the machinery itself is used. Again, the production of all commodities is increased by machinery; and thus the producers of the raw materials of machinery, the carriers of goods, those who keep, clean and tend the machinery, their clerks, porters, and others, must find more employment. It is clear also, that while the manufacturing and commercial population are thus increased by the use of machinery, the agricultural population must receive more employment in supplying them with food.

In this and other ways the general employment of labour is directly extended by machinery. At the same time the application of machinery to existing branches of industry creates new trades and distributes capital into other enterprises which afford employment for new descriptions of labour. A hundred examples of this fact might be cited; of which railways and steam navigation are amongst the most remarkable; but such examples will be superfluous if it can be shown that it is the necessary result of the use of machinery to apply capital to new enterprises. It has been already denied only on the production by reducing the amount of capital employed upon it: it follows that a less amount of capital with the aid of machinery will produce as much as a larger capital without such aid. A portion of capital may be saved for latterly increased production by employing the same capital, or for application to new speculations. In some way it must be employed, or it will yield no profit, and in some form or other it must be ultimately expended, and the capital accordingly reduced to the accustomed operations of his own trade with a profit, he is disposed to do so; but as soon as he finds them less profitable than other investments, he changes the direction of his capital, and seeks new modes of increasing its profits; and thus, if in any country capital be increasing more rapidly than the population, employment will be abundant and wages high; if less rapidly, employment will be scarce and wages low. In the one case, capitalists will be bidding high for labour; in the other, labourers will be bidding against each other for employment. Accumulation of capital is therefore highly conducive to the interests of the labouring population generally, and the use of machinery is especially favourable to accumulation, as may be shown by a simple example. Suppose a man to have a capital of 10,000l., which he is expending annually upon labour in a particular trade, and by proper management succeeds in obtaining 10 per cent profit. Each year his whole capital is expended, and his means of accumulation are thus restricted to a portion of his annual profits only. But let him invent a machine to facilitate his business, and borrow a capital of 3000l. which he can annually repay with interest of 8 per cent. The machine should cost 500l., and the other 5000l. be still expended in labour, he may be said to have saved one half of his entire capital in a single year; for instead of spending the whole of it as before, in labour, he is possessed of a durable property which, at a small annual cost, will last for ten or probably twenty years. Nor can it be said that this saving is effected at the expense of labour; for the owner of the machine is placed in a situation in respect to his profits, which prevents him from securing to himself the difference between the amount paid now and that previously paid for labour. To gain a profit of ten per cent, it had been necessary to spend 10l. annually upon wages, but the possession of the machine, to realize 11,000l. annually, being his whole capital and the profits upon it; but now, in order to obtain the same profit, it is sufficient if he realize 6000l. only: viz., 500l. profit upon his capital recaptured, and 4500l. profit from the use of his machine, to realize 11,000l. annually, being his whole capital and the profits upon it: but now, in order to obtain the same profit, it is sufficient if he realize 6000l. only: viz., 500l. profit upon his capital recaptured, and 4500l. profit from the use of his machine, to realize 11,000l. annually, being his whole capital and the profits upon it: but now, in order to obtain the same profit, it is sufficient if he realize 6000l. only: viz., 500l. profit upon his capital recaptured, and 4500l. profit from the use of his machine.

MACKENZIE, HENRY, was born at Edinburgh in August, 1746. He was the son of Dr. Joshua Mackenzie, a physician in extensive practice and of literary habits. His mother belonged to an ancient family in the county of Nairn. He was educated at the high school and university of his native city; and in 1764 began to study law in Scotland. In 1769 he was called to the Bar, and in 1770 was admitted as a member of the Scottish Court of Exchequer, a department of law-business which is now all but extinct, and which then was extremely limited, and conducted by a few practitioners specially appointed for the purpose. He lived a life of leisure and retirement, and while he was held this place, must have left him abundant leisure for indulging his literary tastes. While in London in 1765, studying the English practice in Exchequer, he had begun to write his earliest and best novel, 'The Man of Feeling,' which was published anonymously in 1771, and for some years was not acknowledged by the author. In 1783 he published his second novel, 'The Man of the World,' and next came 'Julia de Robigni,' his last considerable work of this class. Meantime he had edited two well-known periodicals in the manner of the Spectator: 'The Mirror,' which continued to appear for seventeen months from January, 1779, and 'The Lounger,' which, begun in February, 1775, came to a close about two years afterwards. To the former Mr. Mackenzie contributed forty-two papers; to the latter fifty-seven. Among these are his small novels, such as 'The Storm of the Reoch,' and a collection of dramatic translations, which was one of the earliest races that drew the attention of Walter Scott to German literature. The Highland Society likewise published in their Transactions papers of his on the Highland games, and on the literature of the country of the Osian Controversy. In 1783 he wrote, for an edition of the works of the blind poet Blacklock, a memoir of the author; and a Life of John Home, the author of 'Douglas,'
which he read to the Royal Society of Edinburgh in 1812, was afterwards prefixed to an edition of Home's works, and also published separately. Mr. Mackenzie himself wrote several plays, which are more remarkable for refinement of feeling and language, than for dramatic force or effectiveness. The collected edition of his works contains three of these: 'The White Hypocrite,' a comedy, which was once performed at Covent Garden; 'The Spanish Father,' a tragedy, which Robert Burns had declined to bring on the stage on account of the harassing nature of the cast; and 'The Prince of Tunis,' which had been acted at Edinburgh with much applause in 1775, and printed separately the same year.

The original was by the political writer Lord Melville. His most elaborate work of this sort was 'An Account of the Proceedings of the Parliament of 1784,' which was revised and corrected by Mr. Pitt's own hand; and he published some anti-Jacobin tracts at the time of the French Revolution.

The merit of these services to the government, set forth by his friends Lord Melville and Mr. George Rose, procured for him in 1804 the place of comptroller of taxes for Scotland, an office of large emolument, but considerable labour and responsibility, which he held thenceforth till his death.

In 1808 he edited a complete collection of his literary works, in eight octavo volumes; and this was almost his last contribution to literature. 'The old stump,' as he himself once said, 'would still sometimes send forth a few green shoots; but his official duties occupied much of his time; and the romantic fervour of sentiment, which had produced the figures or effects, was the way to produce the habits of thinking and feeling, such as a man of business may unite with literary tastes and a fondness for literary amusement. Indeed that tendency to stickily refinement, which characterized the major novels, interested the interest of the visionary mind essential to success in the highest walks of literary invention; and he is not the only case in which this cast has put forth all its strength in youth, and been overborne in mature years by the exigencies of life.

Accordingly, for many years, Mr. Mackenzie's leisure was spent either in the society of literary and other friends, or in shooting and sports to which he was particularly attached, and which he pursued as long as his strength permitted. His old age was healthy, cheerful, and happy: a slight deafness alone indicated the decay of nature. He, who had in youth breakfasted with Dr. Johnson, and who had enjoyed the friendship of Blair and Robertson and Adam Smith, lived to see one generation after another, and revolution after revolution in the phenomena of literature.

He had married the daughter of Sir Ludovic Grant of Grant, and by this lady he had eleven children, one of whom has long been a judge in the Supreme Court of Scotland. Henry Mackenzie died in Edinburgh on the 14th of January, 1831. He was buried in the churchyard of the Greyfriars, in the middle of that of a Gregorian telescope; this was to be placed in the interior of the lantern with its polished surface towards the light and its convexity towards the object. The light was concentrated so that none could pass through the aperture in front of the lantern so as to fall on the screen; and that which was reflected from the concave mirror after falling upon one with a plane surface, was from thence to be reflected in a contrary direction upon the object.

The rays in the pencils proceeding from the object were to pass through a lens in the tube, as in the former construction; and, by converging with greater accuracy to points on the screen, they would have produced a more correct image than that which results from refractions light alone.

A remarkable improvement in the manner of employing the magic lantern was first exhibited in London in the year 1809, by William Ford, which serves for more general purposes; and the sliding tube which carries the farthest lens has a greater range of motion. The objects to be exhibited are painted upon a glass plate, which is supported in a groove in the support, and the machine is placed upon a stage which is capable of being moved on wheels in a direction perpendicular to the screen on which the objects are represented.

The screen is usually covered with muslin or gauze, and covered with varnish so as to be quite transparent: it is stretched in a vertical position across the theatre or apartment; and is capable of being made quite dark, the spectacies occupy the space in front of the screen as placed on the opposite side.

In any magic lantern when the tube carrying the lens which is farthest from the lamp is drawn out as much as pos-
able, the magnitude of the image represented on a screen is the smallest; that image increases in magnitude in proportion as the tubes are diminished in length, or as the lens is brought nearer to the body of the lantern. It increases also in proportion as the screen is made nearer to the screen; and the variations of the length of the tubes must, by the exhibitor, be combined with the different distances of the lantern from the screen, in order that by the just convergence of the rays in each pencil, on the screen, the proper degree of distinctness of vision may be obtained under all the variations in the magnitude of the image.

Care is taken that during the exhibition all light shall be excluded, and that the screen shall be dark; but, however, in which, in proceeding from the lantern, produces the image to be observed; and the screen being itself invizable, the spectators can scarcely divest themselves of the idea that they are looking into a dark cavern, in which the objects, at first dimly visible as specks in its deepest recesses, appear to be gradually advancing towards them, increasing in magnitude as they seem to approach: after the objects have been some time apparently in the immediate presence of the company, perhaps surrounded by a blaze of light, they seem to gradually retire, and at length vanish, leaving the place in profound darkness. The effect of the exhibition is, moreover; hence, connected with the harmonious arrangement of instrumental sounds, according to the character of the object, from musical instruments disposed for the purpose.

Spectres are frequently exhibited in this manner; but occasionally observed; and the figures, of celebrated personages are shown; and the illusion produced have caused the name of Phantasmagoria to be applied to the apparatus.

MAGISTRATE, a word derived from the Latin magistratus, which contains the same element as magnus and magister, and signifies both a person and an office. A Roman magistratus is defined to be one who presides in a court and declares the law, that is, a judge. The kings of Rome were probably the sole Magistratus originally, and on their expulsion the two consuls were the Magistratus. In course of time other offices, as those of praetor and Aedile, were created; and those who filled these offices were elected in the forms prescribed by the constitution, and they had jurisdiction. [Genascontr.] The original notion of a magistratus, then, is one who is elected to an office, and has jurisdiction.

In England the term magistrate is usually applied to justices of the peace in the country, and to those called police magistrates, such as there are in London. It has also been applied in other ways; for instance, people have sometimes said that the king is the chief magistrate in the state. But these applications of the term do not agree with its proper severe character; the chief magistrate of a state is that which is derived from a justice of the peace; he also exercised delegated power in his jurisdiction, in which respect, as well as being elected, he is differed from the king of England, who is not elected to the office, and has no delegated jurisdiction, but delegates jurisdiction to others.

MAGNETISM, ANIMAL. [Animal Magnetism, P. C. and P. C. S. MAGNETOMETER] is the name given to a magnetized bar of steel, of considerable dimensions compared with the needle of an ordinary compass, which is employed to determine either the absolute amount of magnetic declination (commonly called the variation of the needle) or the resolved intensities of terrestrial magnetism in horizontal or vertical directions. It has the names of declination magnetometer, and vertical or horizontal force magnetometer, according to the purpose to which it is applied.

The declination magnetometer is of various sizes; for general purposes it is from 12 to 15 inches long, 1 inch broad, and 4 inch thick; but that which is mounted in the Greenwich Observatory is 2 feet long, 4 inches broad, and 3 inch thick: the bar is placed so as to rest at the middle of its length, within a sort of stirrup made of gun-metal, and this, at its other end, has a triangular socket with which it passes a metal cylinder. A skein or a number of fibres of untwisted silk, from 3 feet to 8 or 9 feet long, attached to the middle part of the cylinder, passes over a pulley at the top of the instrument, and a second pulley at the bottom, where it descends, is connected with a small windlass, in order that the bar may be raised or lowered: thus the bar is suspended in a horizontal position, with freedom to turn on a vertical axis till it rests in the plane of the magnetic meridian. The whole apparatus is contained in a box of wood, in order to protect it from the agitation of the air, glazed apertures being provided for the purpose of allowing the observations to be made.

In some constructions, near each extremity of the magnetic bar is a sliding frame of gun-metal: one of these frames carries a small glass plate on which is a graduated scale, and the other carries an achromatic lens, the focus of which coincides with the scale. A small pointer is placed at a certain distance in the direction of the magnetometer the graduations on the scale may be observed through the lens, so that the instrument becomes a sort of collimator; and by means of this, a number of red lines striking the pointer in the wire of the eye-piece of the telescope, the absolute position of the axis of the bar and any variations in its position may be observed.

The stand which carries the suspending fibres of silk generally consists of two pillars of copper, firmly supported on a stone base; and at the upper extremity the apparatus to which the silk fibres are attached is connected with a horizontal circle, graduated, for the purpose of determining the value of any torsion which may exist in the fibres.

Previously to placing the magnetometer in the stirrup, a bar of gun-metal, called a detorsion bar, equal in weight to the magnetometer, and like it, furnished with a graduated scale and lens, is suspended by the silk fibres: this is allowed to vibrate till it comes to a state of rest; the angle which its scale makes with the plane of the magnetic meridian is then taken, and by finding from the readings converted into angular space (the distance of the telescope from the scale being the radius) is the deviation of the optical axis of the telescope from the magnetic meridian.

The telescope having a movement in azimuth, it must then be turned through an angle equal to the deviation, and thus brought into the plane of that meridian. The apparatus would then be ready for use if it were not that some remains of torsion may exist in the fibres, which must be corrected by means of the detorsion apparatus as before.

When it is required to determine the absolute declination, the point which indicates on the scale the direction of the angle between the plane of the magnetic meridian, and the plane of the scale in the telescope, and a correction made for any existing error of collimation, the telescope is turned horizontally to some terrestrial object whose azimuth from the astronomical meridian is known. The difference between the direction of the telescope and the angle through which the telescope was turned will evidently be the required declination, or the angle between the planes of the astronomical and magnetic meridians.

After the actual position of the magnetic meridian has been determined as above, any deviations of the axis of the magnetometer from it, indicated by a different division of the scale coinciding with the vertical wire of the telescope, will denote a variation of the declination; but it is evident that such deviation will be affected by the torsion induced in the silk fibres in consequence of the angular movement of the magnet.

The correction due to this cause of error is to be found from an experimental determination of the relation between the force of terrestrial magnetism and the force of torsion: thus, a magnetized bar being already in the plane of the magnetic meridian, let the torsion circle be turned on its axis till a radius of it has described a small angle (the angle of torsion), and let the position of the magnetometer be observed when it rests between the force of torsion thus created, by which it is made to deviate from the meridian, and the horizontal force of magnetism by which it is drawn towards the meridian. Then, by mechanics, the force (M) of magnetism is to the force (T) of torsion as the difference between the angle of torsion and the angular distance of the bar from the meridian is to the latter distance; or, by proportion, M - T is to M as the given angle of torsion is to the difference between that angle and the distance of the needle from the meridian. The last ratio being obtained from an experiment,
holds good for any corresponding observation; consequently the observed changes of declination must be increased in the ratio of $M$ to $T + M$, or be multiplied by $T + M$, in order to have the correct changes.

When it is required to determine the absolute horizontal intensity of terrestrial magnetism with an apparatus like that which has been described, a magnetic bar of the same dimensions as that which is suspended is used with the latter: this is called a deflecting bar. It is placed in the direction of a horizontal line passing through the centre of the suspended magnet, perpendicular to the magnetic meridian, at two different distances, $R$ and $R'$, from that centre; and the angular deflections produced by its actions on the suspended bar are observed; first, when the north end of the deflecting bar, at each distance, is towards the east, and again when it is towards the west. Half the difference between the observed deflections at the two distances is taken as a mean deflection.

A second mean deflection is obtained from observations made in like manner with the deflecting bar on the opposite side of the suspended bar: let these mean angular deflections be represented by $\theta$ and $\theta'$; then the formula
\[
\frac{n_R}{(R^2 - n)M} = m \tan \theta - m R \tan \theta' - T + M
\]

investigated by M. Gauss, will give the ratio of the force $m$ of magnetism in the bar to the horizontal force $F$ of the earth's magnetism, or the value of $m / F$. The second factor is the correction on account of the force of torsion in the suspending silk.

The value of $m F$, or the momentum of the horizontal force of the earth's magnetism on the suspended bar, may be computed. For, representing the momentum of the bar, with respect to a vertical axis passing through its centre of gravity by $N (N = \frac{1}{2} \mu (a^2 + b^2)$ in which $a$ is the length, $b$ the breadth, and $\mu$ the mass of the bar, whose form is rectangular), $m F / N$ denotes the angular velocity of the bar. But, by mechanics, the angular velocity of a suspended body is expressed by $\frac{d\phi}{d\tau}$ (being the force of gravity, and $\tau$ the distance from the centre of suspension to that of oscillation in the magnetometer), or by its equivalent $\frac{d\phi}{d\tau} = \frac{m F}{T}$, where $T$ is the observed time in which the magnet makes one vibration; therefore, applying thus the correction for torsion,

\[
m F \frac{T + M}{T} = \frac{\frac{1}{2} \mu (a^2 + b^2)}{
\frac{m F}{N} \frac{T + M}{T}
\]

From the values of $m F$ and $m F$, the value of $F$, the required intensity of magnetism in the horizontal direction, may be found.

The biliary magnetometer, invented by M. Gauss for determining both the absolute amount of the horizontal intensity of magnetism and its variations, has been noticed under TERRITORIAL MAGNETISM, F. C. The horizontal force magnetometer at the Greenwich Observatory is biliary, and of the same dimensions as the declination magnetometer. Below it, and under the centre of motive, is fixed a mirror in a vertical plane, but oblique to one passing through the magnetic axis of the bar: this reflects to the eye of the observer a scale which is applied to the opposite side of the apartment, and the telescope being directed to the mirror, in which the magnet declines more or less from the meridian, the numbers which on the scale appear in coincidence with a wire in the telescope increase or diminish. Thus the variations of the horizontal intensity are obtained.

The instrument is held nearly perpendicularly to the magnetic meridian by the force of torsion in the two halves of the skein of silk by which it is suspended: these parts are each about 6 feet in length, and when tied in a loop to the bar, as it surrounds the magnet in a vertical plane, serves to diminish the extent to which the bar would vibrate; and both rings and bar are contained in a double rectangular box, one side of which is plain glass, the box being covered with gilt paper, in order to obliterate the effect of electricity in the apparatus.

The suspended bar being in equilibrio between the forces of torsion and the horizontal force of magnetism, it is evident that if the former force be computed, the latter will be obtained. In order to determine the variations of the horizontal force by the observed deviations of the bar from its mean place the following formula is employed:

\[
dF' \frac{F'}{F} = -\cotan \theta d\phi,
\]

in which $F'$ is the absolute horizontal force, $dF'$ its variation, $\theta$ the angle between a vertical plane passing through a line connecting the upper extremities, and one passing through a line connecting the lower extremities of the two parts of the suspending line; $d\phi$ is the observed deviation of the axis of the needle from its mean place, and is expressed by the length of an arc in terms of the radius. $F'$ evidently gives the variation of the horizontal intensity in parts of its absolute value.

The vertical force magnetometer is a magnetized bar which is crossed in the middle by a short axe perpendicular to its length, and has its lower part, on one side, reduced to an edge. This knife-edge, as it is called, passes nearly through the centre of gravity of the bar, and rests, on each side of the bar, on an agate plane; the whole is supported on a short copper stand, which rests on the instrument. For the purposes of adjustment the bar is furnished on each arm with a screw, which acts as a weight: that which is attached to one arm is parallel to the magnetic axis of the bar, and by moving it forwards or backwards the bar is made to assume a horizontal position: the other is in a vertical position, or at right angles to the magnetic axis; and by moving it upwards or downwards the centre of gravity is made to coincide with the knife-edge. The whole apparatus is capable of being turned on a vertical axis, so that the bar may be placed in any azimuth with respect to the magnetic meridian.

In some constructions of the instrument there is attached to each extremity of the bar a ring of copper carrying two wires at right angles to one another; a line joining the intersections of the pairs of wires should be parallel to the magnetic axis of the bar, and the deviation, if any there be, is determined by observing the intersections on a scale in a microscope, which is fixed on a support near each extremity of the bar; the latter, while at right angles to the magnetic meridian, being for this purpose placed successively in a direct and a reversed position. Half the difference between the readings on the scale is the value of the error.

In order to put the magnetized bar in any required position, a brass bar of the same dimensions as the other, and like it provided with knife-edges, is made to rest on the agate planes, and is brought to the magnetic meridian by means of a magnetized needle which turns on a pivot at the top of the bar. A, theodolite, is fixed on the base of the instrument, and the telescope is turned till the crossing of wires in the field of view bisects a distant object; the telescope is then turned horizontally through an angle equal to the required azimuth in which the magnetized bar is to be placed, but in a contrary direction, and lastly the stand carrying the whole apparatus is turned round horizontally till the telescope wires again bisect the object. The bar will then be situated in the required azimuth.

When the variations of the vertical intensity of terrestrial magnetism are to be observed, the interval between a fixed wire in the microscope and the apparent place of the instrument is measured by means of the moveable wire in the former; the deviation is read on a scale provided for the purpose, and is expressed by a circular arc in terms of the radius. The formula for determining the variation between the absolute vertical force of magnetism and its variation is

\[
dF' \frac{F'}{F} = \frac{n_R}{(R^2 - n)M} \cotan \theta d\phi,
\]

in which $F'$ represents the vertical intensity, $dF'$ its variation, $\theta$ and $\theta'$ are the times in which the needle would perform a vibration in a vertical plane respectively, $\theta$ is the inclination (commonly called the dip), and $d\phi$ is the observed deviation of the bar from a horizontal position at the Greenwich Observatory the vertical force magnetometer is provided with a mirror, which stands over its centre of motion with its plane oblique to the magnetic axis.
of the bar. A scale is affixed to the opposite wall of the apartment, and the mirror reflects it to the eye of the observer, who, looking through a telescope, reads the division of the scale which appears in coincidence with the wire in the field. A building containing the magnetic instruments at Greenwich is in the form of a cross on the plan; two of the walls are parallel, and the two others perpendicular to the magnetic meridian. The declination magnetometer is in the south arm, the horizon magnetometer in the east, horizontal magnetic needle in the west arm of the building; both of these bars are perpendicular to the magnetic meridian. Three telescopes are placed in such situations that their aim may be directed to the needle, one to another, and thus make his observations on the three magnetometers nearly at the same time.

MAGNOLIA, a genus of plants named in honour of Pierre Magnol, who was professor of medicine and prefect of the botanic garden of Montpellier. He was born in 1638, and died 1716. He gave an account of the plants growing wild about Montpellier, in a work entitled 'Botanicon Magneliense.' The genus Magnolia has the appearance of a tree, but it is more of a shrub, with alternate, deciduous, or evergreen simple leaves, and large terminal solitary odoriferous flowers. They are all natives of North America and Asia.

A native of South Carolina Magnolia, or Laurel Bay, is an evergreen tree, reaching sometimes a height of 70 feet. It has oval-oblong coriaceous leaves with the upper surface shining and the under surface rusty; the flowers erect, with from 6 to 9 petals expanding. This plant is one of the tallest and hardiest trees of North America. It has large pale-green shining leaves nearly 10 inches long, with large white flowers. It has been cultivated in England for the last century, and in this country attains a height of from 20 to 30 feet. Several varieties of this species have been named and described. Among the most constant and best known varieties are, 1. M. lutea; 2. M. E. M. magnica; 3. M. globifera; 4. M. Rhombifolia; 5. M. Carolinae by the name of the Big Laurel; the second is the Exmouth Magnolia; the third and fourth are varieties which have been bred from the Mugho endemic. In the cultivation of this species a deep sandy loam, dry at bottom, and supplied with vegetable mould, suits all the varieties. In planting it against a wall, almost any aspect may be chosen except a north-east. This plant may be propagated by stools, which should be laid down in autumn, and require two years before they are fitted for separation. They are then potted, and kept in pits under glass during the winter. It may be also propagated from seeds from America and Asia. M. chrysantha, deciduous Swamp Magnolia, is an almost deciduous plant, with obtuse elliptical leaves, glaucous on the under surface; the flowers from 9-12 petalled, contracted; the petals from 1 inch to 2 inches long, from 15 to 20 feet in height. It is a native of North America, in low moist swampy ground at a little distance from the sea, from Massachusetts to Florida and Louisiana. This plant is also common to Asia and Japan. The bark has a bitter and aromatic odour resembling sassafras. On this account it has been used in America as a substitute for the aromatic bitter barks as Cascara, Canella, etc., and in the Antilles. The flowers from July, 1808, are very fragrant. The flower is used in Asia and Europe, very favourable reports of its efficacy in chronic rheumatism, ague, and remittent fever have been given. All the species of Magnolia possess more or less the properties which are useful for the abolition of the new form of scurvy. The shrub known in America as the bear, seeds, or cones, is equally efficacious. It is said that when the tincture is made from the leaves and cones whilst green, it is more efficacious. In America this tree is known by the names White Laurel, Swamp Laurel, Swamp Sassafras, Sweet Bay, and Beaver-tree. The last name is given to it on account of the fondness of the beaver for it. The flowers are of a cream colour and have a sweet scent, which Kazanek says be sufficient at 60 miles. The flowers are followed by red berries, which give the tree a handsome appearance. The berries are studded in brady and used as a domestic medicine for various complaints.

M. umbrella is a deciduous tree with lanceolate spreading leaves, the adult ones smooth, the younger ones pubescent underneath; the petals 9-12, exterior ones pendent. It is a native of North Carolina, in the Carolinas, in Virginia, and New York. The leaves are 1 to 2 feet long, placed at the ends of the branches in a circular manner, and the form of an umbrella, from which circumstance it has been called the Umbrella-tree. The wood is soft and spongy, and on the mountains of Virginia is called Elmwood.

M. acuminata, a deciduous tree with oval acuminate leaves, the under surface pubescent, the flowers with 6 to 9 petals. It is a native of North America, from Pennsylvania to the Carolinas. The flowers are large, 3 or 4 inches in diameter, of a yellowish colour, mixed with faint blue or pale green, but not remarkable for their beauty. The fruit is about three inches long, and contains 1 seed, and is called the Umbrella-tree. A tincture is made of the fruit, and is used in cases of rheumatism. Several varieties of this plant have been described. It is often used in the London nurseries as a stock on which to engrat the other species.

There are several other species of this magnificent genus found in the forests of North America, all of which are valued in Great Britain for ornamental culture. The best known of these are M. cordata, the heart-leaved Cucumber-tree, with yellow flowers streaked with red, and having a disagreeable odour; and M. curculota, Indian Fishtree, or long-leaved Cucumber-tree, has white flowers, and is a bitter bark, which is used as a medicine by the Indians.

M. Yulan, or conspicua, a deciduous tree with obovate abruptly acuminate leaves, the younger ones pungent, expanding after the flowers, the flowers coniferous appearing before the leaves. It is not quite so hardy as the American species; still, unless the weather is unpropitious, it will put forth an abundance of blossoms during the drizzly months of February and March. M. purpurascens, the purple-leaved Magnolia, is a deciduous shrub, with obovate acutately-veined leaves, almost smooth; the flowers erect, of 3 sepals and 6 obovate petals; the styles very short. This plant is a native of Japan, and seldom attains a greater height than 10 feet. The flowers, when bruised, have a very aromatic odour. The flowers are more or less purple without, and always white within. It is a very ornamental species and worthy of cultivation. The best situation for it is against a wall, where its branches will reach from 15 to 20 feet.

In their cultivation the hardy kinds may be treated in the same way as M. grandiflora. The Chinese kinds are often inarched or budded on M. obusaria. When the plants are replanted after layering or propagation by seed, neither the roots nor leaves ought to be cut off, otherwise they will not succeed so well. (Don, Gardener's Dictionary: London, Encyclopædia of Trees and Shrubs.)

MAHADEVYA. [SYTA, P.C.]

MAHAMD. [SITA, P.C.]

The younger son of Sultan Abdu-ul-Hamid, Ahmed IV, was born on the 14th of Ramazan, a.h. 1199 (the 20th of July, A.D. 1785), and succeeded his elder brother, Sultan Mustafa IV, on the 28th of July, 1808. It is said that Sultan Selim, the uncle of Mahomed, was deposed and imprisoned in 1807 on account of his civil and military reforms, and that Mustafa had no sooner succeeded him than he brought against the Sultan Selim the Nizam Jeed, or body of troops who were disaffected on European principles. Mustafa Raimkar, prash of Resjuk, V., 1. 2 I.
an old friend of the deposed Selim, strongly objected to the policy of Sultan Mustafa, and no notice being taken of his remonstrances, put himself at the head of his troops, marched upon Constantinople, occupied the town, and proclaimed Selim II. Selim II, the son of Solyman the Magnificent, was murdered. After a bloody struggle, and after having confined Sultan Mustafa in the same prison in which Selim was murdered, he proclaimed Mahmud, who was found in a room hid under carpets and books, and his majesty to believe that he was going to be murdered than to be placed on the throne of Osman. Hitherto Mahmud had spent his days in the quiet confinement of the seraglio, chiefly occupied with Turkish and Persian literature, and enjoying, during the last twelve months previous to his accession, the instruction of the captive Selim, who, it is said, foretold his nephew's future elevation, and initiated him in those principles of reform through which he had endeavored, though in vain, to reorganise Turkey. Mahmud was also imbued with that deep hatred of the Janissaries which was one of the leading principles of his future actions.

Mahmud ascended the throne when Turkey was in a violent political and social crisis. In consequence of the enlightened and weak government of Selim the prejudices of the people were roused without meeting with a power sufficient to check them, and the nation was disorganized by the pashas of Europe, Asia, and Africa; and the Janissaries, who were exasperated through Selim's attempts upon their privileges, were ready instruments in the hands of those agitators. The pretext of elevating the murmurs of Selim, or the deposition of Mustafa, were, at first secretly, then openly, sowing the seeds of discord. In spite of this threatening state of the empire, Sultan Mahmud boldly proclaimed that he would carry out the will of Selim, and in choosing Mustafa Bairakzar his grand vizir, he proved that he was not using idle words. Several pashas who were severely punished for disobedience were the first to perceive that their protector was to be given to the more energetic than Selim. When the turn of the Janissaries came, they broke out in open rebellion, and besieged Mustafa Bairakzar, whom they believed to the originator of the reforms, in his fortified palace. Unable to hold out longer, and receiving no relief from the sultan, who was himself assailed by the rebels, the gallant vizir blew himself up. Mustafa was proclaimed sultan, and the rebels cried out for the head of Mahmud. In this critical position Mahmud did a deed at which humanity shudders, but which was one of the boldest political strokes ever attempted by a Turkish sultan: he ordered his captive brother to be strangled together with his infant son; and though twenty-five thousand were preserved, one in four, were sewn up in leathern sacks, and drowned in the Bosporus. By these murders Mahmud became the only male descendant of Osman.

His greatvizir, or grand vizier. Yet he had none other thought than the glory of Turkey, and he made its existence depend upon his own, for with the death of the last of the house of Osman, the empire of Osman would have become a prey to anarchy. The very fact, however, of his being the only descendant of Osman, was a sort of guarantee for his life, for although the people had massacred more than one sultan, and the sultans themselves had shed the blood of more than a hundred royal princes, these crimes were committed against individuals and not against the reigning family, the popular belief being that Turkey would last no longer than the family by whose great ancestor the empire was founded. Mahmud was fully aware of this when he sacrificed his brother and his brother's children, and we may fairly presume that his object was to make himself the only representative of the founder's family.

Mahmud succeeded in crushing this bloody rebellion after a struggle of two days, and having conciliated the Janissaries by abolishing the Nizam Jedid and establishing his authority at home, he turned his attention to his relations with the European powers. In 1812, France and Russia were at war. The Turks were defeated; Constantinople was in danger; the principal pashas in Asia, Africa, and Europe threatened a revolt or had revolted; and Czerny George raised the standard of independence in Servia. Mahmud, although pressed to make peace, persisted in continuing war, and he was encouraged to do so by French diplomacy, for a war between France and Russia was imminent. That war broke out in 1812, and Constantinople became the centre of European intrigue, Russia and Great Britain being active in making peace acceptable to the sultan, while Napoleon made the greatest efforts to dissuade him from any agreement. But the Russians had conquered Northern Turkey as far as the Danube, Mahmud could fairly hope that the Russian army would soon be compelled to evacuate the Turkish territory. He and would perhaps have continued the struggle, but for the strong remonstrances of England, which were backed by a large fleet in the Mediterranean. Under those circumstances he made peace with Russia at Bukarest, on the 26th of May, 1812, on conditions which were too unsatisfactory to him than the unfortunate turn of the war allowed him to expect. He lost only that part of Moldavia which lies east of the Pruth, which now became the frontier of the two empires, and a few districts in the Caucuses; while the Servians, abandoned by Russia, were obliged to submit once more to the Turkish yoke. Mahmud would perhaps never have waged war with Russia, but for the certainty that Napoleon had abandoned him, by a secret article of the treaty of Tilsit, to the Emperor Alexander, and the exorbitant demands which Russia made upon him in consequence of the Czar's friendship with Napoleon. The Russian army thus disengaged immediately set out to cut off the remains of the Ottoman forces from Morocco by the news of the peace of Bukarest, for he had been outwitted by a prince whom he used to call an ignorant barbarian.

Mahmud availed himself of the peace to continue the work of reform. He reversed the policy of his uncle, restored the friends Berber Bashi and Khalet Efendi. He succeeded in keeping down the rebellions spirit of the pashas of Baghdad, Damascus, Widdin, and Silistria; and he received good news from Morroco, where General Boudier, from Meknes and in charge of the conquest of Mocca from the Wahabis who had seized it. His attention was chiefly directed to Ali Pasha of Janina, whom he watched with great suspicion, being convinced that sooner or later that great feudalist would rebel against him. His conduct towards Ali Pasha was signaled by that mixture of craft and frankness which so strikingly in the character of eastern nations; and while he deprived the sons and grandsons of the Janissaries of their offices, and confiscated their estates, he still professed to be a friend of Ali himself, till the moment came for ensnaring and crushing him. The downfall and death of Ali Pasha, in 1822, seemed to promise a harvest of future success to the sultan. But Turkey's enemies were like the hydra; the more heads fell the more ones rose; and no sooner was Ali's head exposed on the gate of the seraglio, than Mahmud had to prepare for a contest with Russia, a deadly struggle with Mahmud 'Ali of Egypt, and an open rebellion of the Greeks.

The Greek rebellion first the attempts of Alexander Yasponti in Wallachia, and of the Greeks of Constanti
tinople, who, with the help of the Greeks of Morroco, cost a fleet, were easily frustrated; but the insurrection in Greece compelled the sultan to make the greatest efforts. Unable to quell the rebellion with the forces under his immediate command, Mahmud divested Mehemet Ali of Egypt of his power and sent him to be governor of the Greeks. Mahmud went upon crusading all rebellion within his dominions, and making himself equally respected by both his Turkish and Christian subjects, declined all interference, and the three powers entered into an alliance by the convention of the 7th of July, 1827. They proposed that Greece should be a vassal state of Turkey, and should acknowledge the sultan's suzerainty by paying an annual tribute. The Greeks protested to submit on that condition, but the three powers went on with their proposition with disdain. Upon this the combined British, French, and Russian fleets attacked the Turkish-Egyptian fleet in the bay of Navarino (30th of October, 1827), and the allies of the East, with the pride of Turkey and her fleet, which had just broken out. The Turks were defeated; Constantinople was in danger; the principal pashas in Asia, Africa, and Europe threatened a revolt or had revolted; and Czerny George raised the standard of independence in Servia. Mahmud, although pressed to make peace, persisted in continuing war, and he was encouraged to do so by French diplomacy, for a war be-
holy war" against Russia, well-knowing that the insurrection in Greece was in a great measure the work of the Czar. Before, however, we proceeded to the Russian war, it is necessary to speak of the destruction of the Janissaries.

Mahmud accomplished this the greatest of his measures at a time when the disturbances that fell from the clouds of his new dream were about to be absorbed by the interference of the three powers in the Greek insurrection. At this time he proceeded openly with his reforms as to leave no doubt of his firm intention to overthrow the system of the Janissaries, that majestic pile of laws upon which the state of things. He had musical and theatrical entertainments performed in the seraglio; he dressed after the fashion of Europe, and abandoned the sacred turban for the fez; and, to the astonishment of hiswife and family, he openly formed an alliance with another Nizam Jefid, or Azaír Mahammediyeh, as he now chose to call these troops. When he signed that order he had like- wise resolved to destroy the Janissaries, who did not allow him to wait for an occasion to begin the contest. On the 15th of June, 1828, the sultan and the grand vizier being then in the country, a strong body of Janissaries, reinforced by a crowd of the worst characters, met at their great barracks the Et-Medîán, and thence marched in battle array to the palace of the grand vizier, which they took and burnt after a bloody resistance on the part of the domestics, who were cut to pieces in the streets, and the people of the place, who were encamped in some subterranean vaults in the garden. The grand vizier hastened to Constantinople as soon as he had heard of the riots, informed the absent sultan of the event, assembled the dispised Janissaries, and himself composed the force that he could dispose of. The shouts of "Down with the Nizam Jefid! we will have the heads of all those who advised the sultan to introduce new institutions!" soon reached the ears of the sultan. A white Khatshé, or the messenger of the seraglio. Thitther Crawford the "ulema and the students, the marines, the sappers, and the officers of the artillery with their guns, all ready to shed their blood for the sultan and his reforms. Encouraged by the presence of so many adherents, the grand vizier sent an answer to the rioters, that he would not satisfy their demands, but would repel force by force. The Janissaries were prepared for war and resolved to attack the besieged army in a small boat from his country-seat at Beshik Tash, on the Asiatic side of the Bosporus. Fully aware of his danger, he harangued his troops, and declared that he would put himself at their head and attack the rebels, but having been dissuaded from this resolution he sent the grand vizier with a body of troops to the mosque of Sultan Ahmed, which was to be the chief meeting-place of the sultan's party, and contented himself with encouraging his men from a look on one of the outer walls of the seraglio. On his order the muti unfolded the "sinjak sheri," or the standard of the prophet, and hundreds of "chakhs," or criers, dispersed themselves throughout the city. The Janissaries, in their foremost detachments, set out to rally round the holy standard, and to defend the throne and their religion against a mob of impious rebels. An immense crowd soon gathered round the seraglio, and marched towards the field of battle near the attendant pieces the detachments which the Janissaries had placed in all the streets leading to that mosque, for the purpose of isolating the grand vizier. At the sight of the holy standard the Janissaries concentrated their forces in the square, around the Et-Medîán, and threw up entrenchments. Husein Pasha, Ibrahim Pasha, and Mohammed Pasha, whom summoned them by order of the sultan, to lay down their arms, were received with a terrible yell and narrowly escaped assassination. They were strong enough, they said, to defend themselves till the evening, and the coming night would bring decisive results in the morning. Two thousand houses in the town would throw light upon their path! The muti now read with a loud voice the first chapter of the Koran, the "Al-Fâtihat," the shortest chapter of the Koran, which is held in as high estimation by the Turks as the Lord's Prayer by the Christians, and is considered to contain the quintessence of the whole Koran. The words run thus:—

'Praise be to God, the Lord of all creatures; the most merciful, the giver of recompence, in such a manner that none can equal him, and of those do we beg assistance. Direct us in the right way, in the way of those to whom thou hast been gracious; not of those against whom thou art incensed, nor of those who go astray; lead us not into temptation, but make us strong against the centre of the hippodrome for more than two thousand years. Six thousand Janissaries perished in the course of one day; several hundreds who had not taken part in the action, but were known to be reformers, were either thrown from their houses, and 15,000, who had kept quiet, were exiled to different places in Asia Minor. On the following day, the 16th of June, a battle sheriff pronounced the abolition of the military corporation of the Janissaries, after it had been the bulwark of Turkey during five centuries from the time of its foundation by 'Ali-ed-din, the vizir of Sultan Urkhan. Thus Mahmud crushed his most dread enemy at home, only four years after he had been compelled to sacrifice to the fury of the Janissaries his favourites Berber Bashi, the muti, and his favourite wife.

Although Mahmud was sufficiently provoked by the Emperor Nicholas to take up arms against him, his declaration of war, in 1828, was a rash act. Mahmud thought that his army, being now organised after the European system, would behave as well as that of any other nation, and that it might be taken, and paid dearly for learning that it is easier to create a name than a thing. We shall not dwell upon the particulars of the Russian campaign. After an indifferent struggle in 1829, the Russians, under the command of General D'Inglefield, made astonishing progress in 1829, in Europe as well as in Asia; and after the victory obtained by Diebitsch over the grand vizier Josuè Pasha at Shumal, in the eastern Balkan, and the capture of Esz-Rim by Paskiewicz, Constantinople would have been lost, and the Turkish empire would have fallen a prey to the Russians, but for the interference of the great European powers, headed by England, through whose mediation the war was terminated by the Treaty of Paris, on 14th of September, 1829. This was the most disastrous war that was ever undertaken by the Turks, although their loss of territory was comparatively trifling, and far less than the loss of Hungary and Servia after the peace of Karlowitz and Passarowicz with Austria. Mahmud's direct loss was only a small tract on the Caucasian frontier. But Greece was now definitely separated from Turkey; the suzerainty of the Sultan over Moldavia and Wallachia was reduced to a shadow, and the Russian emperor acquired that sovereignty over the two principalities, which was formerly possessed by the Turks; Servia was acknowledged as an independent state, though tributary to Turkey; and the Black Sea was thrown open to the ships of all nations. The Black Sea to the Mediterranean, and an effective protector- ship over the Greek church throughout all Turkey; and the sultan at last was required to pay the expenses of the war, a sum so heavy that the Sultan felt constrained to solicit the remittance of about one-third of it. The circunstances most humbling for the pride of the sultan was that he obtained that peace through the mediation of the European powers.

During the years subsequent to the peace of Adrianople, Mahmud, with unabated perseverance, was active in creating a new army and navy, and in improving his ruined finances. He wanted both men and money to check the increasing power of Mehmed 'Ali, whom he watched with hate and suspicion. A conspiracy detected at Constantinople to depose the sultan, was attributed to the intrigues of the Greeks of Egypt, and increased Mahmud's hatred: to reward those who had proved most loyal under such trying circumstances he formed a new order, the Nischia Ischluss. In 1831 hostilities were commenced with Mehmed 'Ali, Ibrahim Pasha, who had made a raid against the Pasha of Damascus and conquered Syria; but there was not open war till 1832, on Mehmed 'Ali's refusal to withdraw his troops from Syria. The declaration of war took place on the 11th of March, 1832. When Ibrahim defeated the Turks at Hems; and on the 21st of December he obtained the splendid victory of Koniah, in consequence of which the Turkish army was disbandeled, and the Egyptians advanced to the very gates of Rhodes. The assembly had now to decide whether the European powers should enforce a truce; but in spite of it Ibrahim pushed on and occupied Brussa. The ruin of the sultan seemed to be inevitable. He was saved by his greatest
enemy: a Russian fleet appeared off the Bosporus, and opposite Constantinople landed a strong body of Russians, commanded by General Lazarev, whose arrival stopped the progress of Ibrahim. On the 4th of May peace was concluded at Koniah, and Mehemmed Ali obtained the object of his arms, the surrender of Smyrna and Adana; but he remained a tributary vassal of the Porte. So much was Turkey weakened through this war, that Mahmud, despairing of further independence, threw himself into the hands of Russia, and on the 8th of July signed the treaty of Uzak-Kaleiski, by which Russia bound herself to assist Turkey with an army whenever she should want it, in acknowledgment of which Mahmud promised to repair a hitherto armed ship of foreign nations should be allowed to pass the Dardanelles without the permission of Russia. Mahmud was more fortunate in an expedition against Tripoli, which was brought back under the sultan's immediate authority, and at Tunis also he succeeded in obtaining obedience to his orders.

Mehmed's hatred of Mehmed 'Ali became now the principal motive of his actions. As early as 1834 things were so bad, that Mahmud not only resolved upon a fresh war, but put himself at the head of his troops in order to conduct it in person. But in crossing the Bosporus he dropped the sacred sword of Soliman II., which fell into the sea and was lost for ever, and this put an end to his hopes of ever returning to Constantinople. War was prevented by the mediation of England, France, and Russia, but the sultan nevertheless continued preparing for a contest which he wished, and which his subjects dreaded. The contents of the letter, which he bestowed upon his military preparations was surprising. Yet the result did not answer his expectations. He thought that because he had a system of order on paper, the administration was as well as in Europe; and he forgot that the execution of his orders was to be intrusted to persons who themselves had first to learn obedience and impartiality. In his first war with Mehmed 'Ali he was the victim of the knavish tricks of some of his men, especially of the old Khoisrov Pasha, without ever suspecting how unfairly he had been dealt with. Sufficient money was intrusted to Khoisrov to defray the expenses of the war, and the strictest orders were given as well as in Europe; but when the end of the campaign, Husein returned to Constantinople, he did not dare to complain of the peculation of the powerful minister. Reshid Pasha, another commander, received the most solemn orders to provide military stores, and for three years was paid for the army, in the different towns of that part of Asias Minor where he was to command, but when he came to Ak-Shehr, his men found that the best chance of getting a dinner was in the Pasha's house. The second war with Mehmed 'Ali would perhaps have broken out so soon (1840), but for the pasha's manifest design to subject all Arabia to his authority; and it is said that the sultan was urged by Russia, and especially by Great Britain, to open the campaign in that year, although he knew that his army was not yet able to take the field with any chance of success.

On the 29th of June, the Turkish army under Hafiz Pasha was entirely defeated by Ibrahim Pasha, near Niabis; and there being no other army to oppose his victorious career, it was evident that Turkey was lost if the European powers did not interfere. Mahmud was fortunately not destined to hear of the disgrace of his arms. He died on the 1st of July, 1840, a few days before the news of the battle of Niabis reached the seraglio. The Sultan Mahmud I. was a man of many parts. He was not a soldier but a negociant. He understood commerce, and he knew that the first step in his policy was to increase the business in wine. Two German physicians, under whose care he was, declared his ailment to be tubercular phthisis; shortly before his death they were dismissed, and, as the younger Michael in the "Biographie Universelle," says, were superseded by an English quack, through whose efforts the sultan died; two months before his death could have been expected to take place according to the nature of his disease. Mahmud was succeeded by his eldest son, Mejid, the present sultan.

Sultan Mahmud II. was a handsome man, of majestic appearance. He was always active, and at no period of his life did he abandon himself to those sensual pleasures of which so many of his predecessors were subjects. He rose before daybreak to be ready to say his prayers the moment the sun was above the horizon; after prayer he used to work six hours or more, according to the state of business; he never made his toilet after dinner; and visited the places, the docks, or the barracks. He always tasted the soldiers' dinner, rewarded the cooks when it was good, and punished them when it was bad. The soldiers called his children and many of them loved him as a father. For a Turk Mahmud possessed considerable knowledge; his handwriting was beautiful, an accomplishment which contributed much to his popularity among the learned, for the sultan is supposed to surpass his subjects in penmanship. He was an excellent father and loved his wives tenderly: on his death-bed he ordered his son 'Abdul-Mejid to come to his side, and he entreated him never to abandon the path of reform. Yet he was only half civilized, as a Turk was then considered. He was conscious of the inferiority of a Turk with all the artfulness of modern diplomacy. His knavish tricks against 'Ali Pasha of Janina and Prince Milosh of Servia are well known. He could be cruel in cold blood; he murdered his eldest son. He was as cruel as Constantine Moralli, at the murder of the patriarch Gregory, and the violent death of many others who had incurred his hatred. For the details of his reforms we refer the reader to Turker, C. O., p. 145, and to the works of some of the most remarkable men of his age, and one of the greatest sultans of Turkey. He may be compared with Peter the Great, and like him he was idolized by one portion of his subjects and hated by another. As a Minor he was the old school called him a heretic (philoser), and accused him of attempting to destroy the religion of Mohammed and to introduce the Christian faith, a calumny which grieved him very much, for he was a great lover of books and had made a law of prohibition of wine. If Mahmud was less successful than Peter the Great, it must partly be attributed to the circumstance that the Russian Czar ruled over one nation professing one religion, his Mohammedans being proportionally too few in number to offer any serious resistance; Mahmud ruled over seven nations, Turks, Wallachians, Albanians, Greeks, Slavonians, Armenians, and Arabs, some of them Mohammedans, others Christians of various creeds, and all of them detesting each other. Among these the ruling nation, the Turks, form the great minority in European Turkey, and in Asia Minor are less numerous than the Greeks and Armenians together. The infection of the Turks is almost exclusively Arab. We conclude this sketch by an extract from the Turkish historiographer Asa Efendi, quoted by Michaud in the source mentioned above, who gives the following portrait of Sultan Mahmud II.

' Mahmud is terrible like Alexander. The slightest menacing cast of his countenance would check 100,000 rebels; and his awful frowning crushes the impious followers of Shredda who dare to take up arms against him. Such is his power, and such the soundness of his genius, that he silences the most subtle metaphysicians and rhetoricians, strikes them with astonishment, and compels them to lower their heads before his superiority. There is not his equal among the weakest of the kings, for, as the poet says, 'He presides equally over the warriors, the learned, and the charitable, by his exploits, his speeches, and the demonstrations of his merit, his handwriting is of extraordinary beauty; the points (diacritical) are like so many fixed stars; and it is worthy to be hung up under the vault of heaven near the girdle of the angels.'
he great no other limits to our sultan's success and years than those of numbers, namely infinity.'

(Sultan Mahmud and Mahmud 'Ali Pasha, by the author of 'France, Russia, and Turkey,' 3rd edition, London, 1835; Von Hammer, Des Osmanischen Reiches Staats-Verfassung und Verwaltung in der 18. und 19. Thausendjahrhundert, 1818; MAIA,'NIO, BENEDETTO DA, a celebrated Italian sculptor and architect, was born at Florence, in 1444. He first distinguished himself as a carver and inlayer of wood, and was occupied in the decoration of the Cappella del Transito of S. Spirito in his time. He executed some very extraordinary inlaid-work for cabinets for the kings of Naples and Hungary, and an accident which happened to two which he made for the latter king caused Malvasia to give up the art of inlaying in disgust. These two chests or cabinets suffered so much in the transport from Florence to Hungary by undue care or the change of climate, that when they were uncovered by Benedetto before the king, a great part of the inlaid-work, owing to the effect of the moisture on the glue, fell to pieces, to the great dismay of the king and the horror of the artist, and had to be remade. Benedetto felt that an art in the works which were subject to destruction by the will of others was unworthy the attention of superior abilities, and he thenceforth applied himself exclusively to sculpture in marble and to architecture.

Benedetto's marble works however were also of an ornamental or decorative character. His statues, busts, and portrait paintings were of a more elaborate character, being loaded with beautifully executed small figures, besides other decorations. One of his master-pieces is the justice bench at the Ducal palace at Mantua. His statues represent the life of San Francesco, and the establishment of his order, in five compartments; with the figures also of Faith, Hope, Charity, Fortitude, and Justice. The bench was beautifully executed by Giambologna, and was published with letter-press description in 1585—Il Pergamo scolpito in marmo da Benedetto, da Maiano nella Chiesa di Santa Croce in Firenze. Benedetto also made the crucifix above the altar of S. Maria del Popolo in Florence; he finished the Magdalen in Santa Trinita, which was left imperfect by Desiderio da Satignano. In architecture he did very little: he built the portico of the church of the Madonna delle Grazie near Arezzo; a chapel for himself on his own estate near Prato; and he is said to have designed the Palazzo Strozzi. He died rich in 1495, aged only fifty-four, and was buried in San Lorenzo at Florence. He left the reversion of his property to the brotherhood of the Bigallo.

GIULIANO DI NARDO DA MAIANO, the uncle of Benedetto, was likewise a distinguished artist, and in similar works. He was the first to introduce the new styles and charges in Florence, in Pisa, in Loreto, in Naples, and in Rome. He succeeded Brunelleschi as the architect of the cathedral of Florence in 1446. At Naples he built the palace of Poggio Reale, which now forms the centre of the extent of the city, and the triumphal arch, and the reliefs of the Castello Nuovo (now the Arsenal). At Rome he built of Travertine stone the loggie of one of the courts of the Vatican; and the church and palace of San Marco for Pope Paul II. in the same material; and a report was long in circulation that part of the Colosseum was pulled down for the stones, more charitable persons have presumed that the pope used only such stones as had already fallen. Giuliano commenced also, in 1446, a new nave to the church of the Madonna at Loreto, which was completed by his nephew Benedetto. Giuliano was still living in Florence in 1471, a fact clearly ascertained by Boccaccio, an inhabitant of my own city, in the reign of Alfonso I. (1435-1458), is erroneous; this statement is also evidently incorrect from the fact of Giuliano being employed by Paul II., who was pope from 1464 to 1471.

(Vasari, Vite de' Pittori, &c., and the Notes to the German translation by Schomb; Cicognara, Storia della Scultura; Humorke, Italianische Forschungen, 1852.)

MAINTENANCE, SEPARATE. [SETTLEMENT, P.C.]

MALATESTA, MALATESTI, Lords of Rimini, an historical family of Italy during the middle ages. Like many other great feudatories of Italy, they are said to have originally come from Germany. One of the name is mentioned in some chronicles as 'Vicario,' or Imperial Lieutenant of Rimini, under Otho III., A.D. 1002. It is not, however, until the second half of the thirteenth century that we find authentic records of this family as being at the head of the Guelph party in Rimini. Giovanni Malatesta, called 'il Zoppo,' or 'the lame,' married Francesca, daughter of Guido di Polenta, Lord of Ravenna. Paolo, brother of Giovanni, seduced her wife, and being caught in adultery with her, they were both put to death in the streets by the public. This tragic event forms the subject of one of the most beautiful episodes of Dante's 'Inferno.' After many vicissitudes, owing to the faction of those times, we find Galeotto Malatesta, in the early part of the fourteenth century, acknowledged by the Pope as Lord of Rimini, Pesaro, Fano, and other places in the Papal State. His descendants continued in possession of these territories, with interruptions, till the time of Clement VIII., in 1598, when Sigismondo Malatesta was deprived of his dominion by the Pope, and retired to Venice, after which several of the same family figured in the service of that republic. One Carlo Malatesta had already distinguished himself in the wars of the fifteenth century, between the Duke of Milan and the Venetians. (Sanavino, Famiglie Illustri d'Italia.)

MALAXIS, a genus of plants belonging to the natural order Orchideaceae, and to the tribe Malaxisideae. It has a patent petiole, the lip posterior, erect, entire, similar to the petals and smaller than the sepals; the spur absent; the flower in the axil of the leaf. It is a terrestrial herb, with a rotenoid terminal, continuous with the short column, out of the apex of which it appears as if it were excavated with two imperfect cells; the pollen-sac connected at their apex; the anther a spongy box, where it grows upon the moss, in the character of an epiphyte, and not amongst it as other bog-plants.

MALINGERING. [FRIEDRICH DISEASE, P.C. 8.]

 MALLOWS, JAMES HARRIS, FIRST EARL OF MALMESBURY, JAMES HARRIS, was the only son of James Harris, the learned author of 'Hermes,' and other well known works. His mother was Elizabeth, daughter of John Lake, of Lake, in the county of Somerset, Esq.; and he was born at Salisbury on the 21st of April, 1746, the day of the battle of Culloden. The Harris's had been settled on their estate of Orcastone St. George, in Wiltshire, since about the middle of the sixteenth century. The father of the subject of the present notice was the first of them who was ever in parliament or employed in any political capacity. He was considered as having belonged to the first class of the gentry in the county. The father of the author of 'Hermes' married a daughter of the second Earl of Shaftesbury. After having instructed him in the grammar-school of his native town, the subject of this notice was sent to Winchester, where he remained till September, 1762. His father, who was by this time in office, now kept him with him in London for some time, and the Earl sent him to Peterhouse College, Oxford. In a letter written in his advanced years he expresses himself as unable to decide whether his father did right or wrong in introducing him to society before he was sent to the university. 'I believe,' he says, 'the seeing many of the leading men in administration, hearing them converse on public business, contributed to form my mind to think on public affairs, and to give me interest in them which, probably, otherwise I might never have acquired; but the mixing at that age (seventeen), and raw from school, in all the gaiety and dissipation of London, filled my mind at the same time with false objects of admiration, false notions of excellence, and an rashness in my own deportment, which in the world so much greater than I supposed my fellow-collegians could possibly possess, that I apprehend I carried to the university a considerable share of self-sufficiency, and no great propensity to attend lectures or to obey college rules.' But although he professed to look back upon the years he passed at Merton as the most unprofitably spent of his life, he appears to have by no means altogether neglected study amid the then prevailing idleness and dissipation of the place. Even in his own disparaging account he admits that, although he never saw his tutor at any other time, he did receive his instructions for the hour before night, when he took it into his head to be taught trigonometry.

On leaving Oxford in 1765 he was sent for a year to study at Leyden; and here at least he seems to have made excellent use of his time, spending many hours daily among his
books, while he also mixed much in society. He then, after seeing eight months at home, set out in 1767 on a short confidential tour, in the course of which he visited Holland, France, and in the autumn of the same year he was, through the patronage of Lord Shelburne, his father’s colleague and friend, appointed secretary of embassy at Madrid, and thus entered public life at the age of one-and-twenty.

Three years after the affair of the Falkland Islands occurred, when he chanced to have been left at Madrid as chargé d’affaires, and, acting upon his own responsibility, he had the good fortune very luckily to bring to Parliament a document to concede the object in dispute. The Falkland Islands, the acknowledgment of our right to which was thus obtained from Spain, were given up by England four years after; but the temple and firmness, as well as talent, with which Harris had managed his successful negotiation, gave so much satisfaction to his government, that he was the following year appointed to the post of minister at the court of Berlin.

He retained this mission for four years, and then returning to England in 1776, married Harriet Mary, second daughter of Sir George Amysd Cornwell. In 1777 he was sent as ambassador to St. Petersburg, and, having, in the mean time, received the Order of the Bath in 1780, he remained in Russia till his health compelled him to return home in 1784. He had ever since 1770, notwithstanding his being abroad, held a seat in the House of Commons for Christchurch, and had, like most of Lord Shelburne’s friends and connections, attached himself to the party of Mr. Fox. When Fox, however, was now superseded in the direction of affairs by Pitt, Harris left his seat in Parliament and withdrew from the government. He was, however, in 1786, appointed minister at the Hague, to which he had intended that he should have been appointed if the Fox and North administration had remained in power; and he accepted it with the full approbation of Mr. Fox. While at the Hague he succeeded in negotiating, in April, 1788, the treaties of alliance with Holland and with Prussia, by which the power of the Stadtholder was at that time preserved from being overthrown by the democratic party, which had obtained in Austria and Holland, and threatened to grasp of France. For this great service, as it was considered, Sir James was, in September of the same year, raised to the peerage as Baron Malmsbury.

He now, after a short visit to Switzerland, returned to England. He continued to act with the Whig party in parliament till 1792, when he formed one of the large body of the friends of Mr. Fox, who went over the ministers with Burke and the Duke of Portland. Lord Malmsbury was now sent over by Mr. Pitt on a mission to Berlin, where he prevailed upon the new King of Prussia to enter into a second alliance with England and Holland, which however did not last for quite two years. In 1794 he was employed to negotiate the marriage between the Prince of Wales and Caroline, the daughter of the Duke of Brunswick; and, after having gone through a series of difficulties, Lord Holland, acting as Caroline’s proxy, accompanied her to England. His published Diary relates many curious particulars respecting this affair, the issue of which was hardly more unhappy than he had anticipated. In 1795 he was induced to direct his whole energies to the promotion of the colony of New Zealand, which he visited in 1796. He was elected a member of the House of Commons for Northampton, and was returned by the borough of Northampton till his death. He attended to his professional duties, preached regularly in his turn in the college chapel, and enjoyed the society of his former pupils. When, however, apparently in strong health, while on a visit to his father-in-law Mr. Eckersall, at Bath, where he died December 29, 1824. He left a widow and a son and daughter.

The attention of Mr. Malmsbury had from an early age been directed to political economy, in which he was much stimulated by his conversations with his father. The two most important of his works are, the ‘Essay on the Principle of Population,’ of which an edition was given in the article Population, P. C., and the ‘Inquiry into the Nature and Progress of Rent,’ the leading principles of which are stated in the article Rent, P. C.

When Lord Malmsbury visited Cambridge, Malmsbury displayed a great love of fighting for fighting’s sake, a keen perception of the ludicrous, much relish for wit and humour, and a considerable comic power of imitation; but his character gradually changed; he was serious and amongst his friends and men of the present earl, in 4 vols. 8vo., Lond. 1844; and which, besides throw much valuable illustration upon many of the events and transactions of the important period in which it was his fortune to live and act. The materials of the present article have been mostly abstracted from the Memoir prefixed to that publication.
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3. 'An Essay on the Principle of Population; or a View of its past and present effects, with an Inquisition into our Prospects respecting the future Removal or Mitigation of the Evils which it occasions.' New edition, London, 8vo. 1803.

4. 'A Letter to Samuel Whitbread, on his proposed Bill for the Amendment of the Poor Laws.' London, 8vo. 1807.

5. 'A Letter to Lord Grenville, occasioned by some observations on his Lordship's Speech on the East India Company's Establishment for the Education of their Civil Servants.' London, 8vo. 1813.


7. 'The Grounds of an Opinion on the Policy of restricting the Importation of Foreign Corn,' intended as an appendix to the 'Observations on the Corn Laws.' London, 8vo. 1815.

8. 'An Inquiry into the Nature and Progress of Rent, and the Principles by which it is regulated.' London, 8vo. 1815.

9. 'Letters on the Establishment of a college, with an Appeal to Facts in Refutation of the Charges lately brought against it in the Court of Proprietors.' London, 8vo. 1817.

10. 'Principles of Political Economy, considered with a View of their Application.' London, 8vo. 1820.

11. 'The Measure of Value stated and illustrated; with an Application of it to the Alteration of the Value of the English Currency since 1790.' London, 8vo. 1823.

12. 'Definition in Political Economy, preceded by an Inquiry into the Rules which ought to guide Political Economists in the Definition and Use of their Terms.' London, 8vo. 1827.

13. 'A Summary View of the Principle of Population.' 1830. (From the 'Supplement to the Encyclopaedia Britannica.')

(Memoir of Malthus, prefixed to the 'Principles of Political Economy,' 2nd edition, Pickering, London.)

MALUS, ETIENNE LOUIS, a distinguished philosopher and military engineer, was born at Paris, June 33rd, 1775. He received his first lessons under the eyes of his father, Anne Louis Malus of Mity; and, in early youth, his time appears to have been nearly equally divided between classical and mathematical studies. This judicious combination of the two great branches of education had the happiest effects, and formed the foundation of those developments of genius by which his name will descend to the remotest posterity. His memory was very retentive, and it is said that, even near the close of his life, he was able to repeat in a moment characteristic verses of considerable length. His taste for classical literature is shown by the fact that, when seventeen years of age, he had written a tragedy entitled 'The Death of Cato;' but subsequently his studies were almost exclusively of a scientific character.

At the time that the tragedy is said to have been written, young Malus was, after a strict examination, in which he acquitted himself to the satisfaction of the persons in authority, admitted as a pupil in the Ecole de Génie Militaire, it being the intention of his father that he should enter into that branch of the public service; and he is said to have immediately distinguished himself by his diligence and his scientific talents. From some cause, however, which is not explained, but probably because his father, who held the post of Treasurer of France, had become suspected by the government (the great revolution having commenced), he was dismissed from the Institution; and, either from poverty or compulsion, he entered the army as a private soldier. He was for a short time employed in that capacity, with the battalion to which he belonged, in repairing the fortifications of Dunkirk. But on the termination of the war, according to the government having decided upon the formation of the Ecole Polytechnique, inquiry was made for a certain number of officers for the exterior; but, as he was not yet approved of by the Government of the interior, might be the first to receive instruction in the higher branches of science; and it is recorded to the honour of M. Le Père, the commandant of the engineers at Dunkirk, that, knowing the great talents of the young soldier, he withdrew him immediately from the ranks and appointed him to Pariis, with a recommendation to the celebrated Monge. Malus was immediately admitted, and was joined, in a class, with about twenty other persons, to attend a course of instruction in mathematics, physics, and engineering, under the direction of Monge and his assistants. During three years he prosecuted his studies with extraordinary ardour, and distinguished himself by his applications of analysis to the solutions of some intricate propositions; he is said also to have occasioned an inquiry into our prospects respecting the future removal or mitigation of the evils which it occasions.

On quitting the Ecole Polytechnique, Malus was for a time employed as a professor of mathematics in the military school at Metz; but the small fortune which he possessed, his family having suffered great losses during the Revolution, and perhaps an inclination in favour of a more active life, induced him to abandon the project which he at one time entertained of devoting himself entirely to the sciences. He therefore entered into the service of engineers with the rank of captain; and, in 1797, he was sent to join the Army of the Sambre and Meuse. He accompanied that army across the Rhine, and was present at the actions of Ukranz and Alten-Kirch. The East Indies being then an object of ambition, he volunteered, with an Appeal to Facts in Refutation of the Charges lately brought against it in the Court of Proprietors.

When the Institute was founded in that city, he was appointed one of its members; and in the first volume of the 'Décade Egyptienne' there is an account of an excursion which he made far into the country, with his discovery of a branch of the Nile which had not before been noticed. Malus continued in Egypt till the remains of the French army capitulated, when, in 1801, he returned to his native country in an English vessel. Exhausted by the arduous services in which he had engaged, and being nearly ruined, he yet performed the duties of an officer of engineers, having, in 1804, been appointed by the government to superintend the construction of the works which were for the first time carried out in Egypt, and to be the title of sub-director of fortifications, and he was made a member of the Legion of Honour. Five years afterwards he was appointed superintendent of barracks in the department of the Seine; and in the following year, 1810, he was made a member of the Committee of Fortifications and Lieutenant-Colonel of Engineers.

Almost immediately on his return to France, Malus married a daughter of Koch, the Chancellor of the University of Giessen, to whom he became attached before his departure for Egypt; and, during the rest of his life, all the time he could spare from his professional avocations was spent in the cultivation of the sciences, particularly in the continuation of those optical investigations which he had commenced at the Ecole Polytechnique. His first published work was entitled 'Traité d’Optique,' in which, by the phenomena of the refraction and reflection of light as they have then been discovered, and by particularly distinguishing himself by his experiments and researches concerning the refraction of light in transparent media. It was then discovered that when a ray of light was entered into glass at a considerable angle of incidence, the internal reflection takes place either before it arrives at the posterior surface, or at a certain distance from that surface on the side from which the ray entered the glass; and it was determined, though an inequality in the angles of refraction in the two cases was manifest, to which of the cases either of the observed reflections should be referred. Malus overcame this
difficulty by applying successively to the surface an opaque medium, which, by preventing the reflexion of the emergent rays, proved that the observed reflexion had taken place where the transparent medium by which, by permitting the rays to pass quite through the glass, afforded a reflexion from the exterior of the latter.

The subject of double refraction in crystals was very impor-
tant. Some years ago, in 1808, the Academy of Sciences, in France
offered a premium for the best Memoire on the subject; and Malus immediately entered with ardour into this field of research. It was while prosecuting his experiments that he learned to him one of those fortunate incidents which only men of genius have the power of rendering available as steps to great discoveries. He then resided at Paris, and, happening one day to direct a prism of crystal which he held in the hand, towards the windows of the Luxembourg palace, on which there was a brilliant light produced by the reflected rays of the setting sun, he was surprised to find that, while turning the crystal round, one of the images produced by the double refraction in it varied in intensity, and alternately appeared and disappeared. As such phenomena had not been observed when the prism was directed to any other bright object, as the flame of a candle, Malus was for a time at a loss to divine the cause; but after making several observations on the light from the same windows, he ascertained that the effect was produced only when it fell on them at a particular angle of incidence, which he determined from the known position of the sun with respect to the surface of the building.

In the prosecution of the researches to which this interesting discovery gave rise, Malus found that when a pencil of light is reflected from a non-uniformly polished surface, the intensity of light varies with the angle of incidence equal to 54° 30', or from the surface of water at an angle of incidence equal to 52° 45', the reflected light possessed the same properties as were exhibited by one of the pencils produced by a prism in refraction in a crystal. He observed also that when the pencil reflected from a transparent medium, at a certain angle of incidence, is made to fall on another such medium at an equal incidence; if the planes of the second refraction coincide with those of the first, the light is reflected as usual; but if the planes are at right angles to one another, no reflection takes place at the second surface, the pencils of light being wholly refracted.

To the effect produced on light so reflected, Malus gave the name of polarization; conceiving that the particles of light have poles or axes, and that, on entering the doubly reflecting crystal, those forms in which one of the pencils may arrange themselves so as to be capable of being transmitted through it, while those which should have formed the other ray may have such dispositions as prevent the passage, in certain directions, from being effected.

It may be said to have laid the foundation of a new branch of physical optics; and an account of them is given in the Mémories de la Société d'Arcueil, as well as in the Mémories of the French Institute. Of this learned society, as immediately as it was instituted; and in 1811, though, on account of the war, there was scarcely any intercourse between Great Britain and France, the Royal Society of London awarded him the Rumford medal; thus performing a noble act of homage to scientific merit in the person of a foreigner, and one who carried arms among the enemies of the country.

In 1810 Malus published at Paris his Théorie de la Double Réfraction de la Lumière dans les Substances cristal- lisées; and in the following year he presented two papers to the Institute on some remarkable phenomena of polarized light. In the first of these it is shown that when a pencil, after being turned by refraction, falls on glass, part of it is reflected and part transmitted; the reflected part is wholly polarized in one direction, while the transmitted part consists of two portions, in one of which the particles preserve the character of direct light, and in the other the light is polarized in a direction contrary to that of the reflected pencil: it is added that the portion which has the character of direct light diminishes gradually by transmission through several planes of polarization, until it has disappeared; and the transmitted ray becomes polarized in a direction contrary to that of the reflected pencil. In the second paper it is shown that all polished bodies, opaque and transparent, polarize light by reflection, but the nature of the species which are polarized in one direction only. He observed the modifications which parts of organized bodies, whether animal or vegetable, produce on light when they are thin enough to be considered as translucent; and he pointed out how the coloured and multiplied images which are sometimes seen in Iceland spar. He described these images to the effects of figures parallel to the longer diagonal of the crystal rhombo- id; but David Brewster showed that they arise from veils which act upon the transmitted light at both of their surfaces.

During the short remainder of his life, Malus continued his scientific researches amidst all the duties which his post as a member of the Committee of Fortifications required. He was chosen Examiner in Physics and Descriptive Geometry at the Ecole Polytechnique; and though his health was fast declining, he neglected no occasion of performing the functions of that office. He was on the point of being made Director of the Studies in that Institution when he was removed by death from the scene of his useful labours.

He died in Paris, February 23rd, 1812, in the thirty-seventh year of his age; and his wife, who, ever since their union, had alleviated his labours by her attentions, and watched him in his last days with affectionate solicitude, survived him by nine years.

Malus enjoyed the esteem of the public for the qualities of his mind, and was beloved by all who knew him for the benevolence of his character.

(English translation at an angle; Biographie Universelle.)

MALVA (the Latin Malva), a genus of plants belonging to the natural order Malvacese. It has numerous styles, a double calyx, the outer one three-leaved, the inner one five-leaved. The capsules are triangular and many-celled; the cells one-seeded and circularly arranged.

M. Moschatia, the Musk Mallow, has an erect stem, kidney-shaped leaves, with five or seven deep pinnatifid lobes, the lower leaves in rosette with those in various parts of the plant, the fruit-stalks erect, and the fruit hairy. The flowers are large and rose-coloured, on axillary single-flowered peduncles, crowded at the extremity of the stem and branches. It is native in many parts of Europe, and is found in Britain in grassy borders of fields and by waysides.

M. sylystra, Common Mallow, has an erect stem, and is distinguished by its kidney-shaped leaves with seven deep crenate lobes; the fruit is glabrous, reticulate-rugose. The flowers are large and of a purple colour, much longer than the calyx, which is hairy. It grows on waste places and road sides in Britain, and is native in most parts of Europe. The whole plant is beset with abundant hairs. It is a honey flower, and is much visited by butterflies. In some cases it is propagated by semi-internal irradiation. Decorations of the leaves are employed in dyestry and in general for removing supposed scorim- isms, as it is said to have the power of drying up a wound, in which it is used in some cases of internal irritation. Decotions of the leaves are employed in dyestry and in general for removing supposed scorim- isms, as it is said to have the power of drying up a wound, in which it is used in some cases of internal irritation.

This species is the Malva of Pliny, lib. 20, cap. 21; also, in Columella, lib. 10, cap. 247: it is the polychy of Theophrastus, lib. 3, cap. 17, and the eronv polychy of Dioscorides, lib. 2, cap. 144.

M. rotundifolia, Dwarf Mallow, has a decumbent stem, roundish heart-shaped leaves with five shallow acutely crenate lobes, the outer sepals linear lanceolate shorter than the oval acuminate stellately hairy inner ones. The flowers are small and purple, and two or three times longer than the calyx. It is common in waste places in most parts of Europe, and is native of Britain. It is the M. vulgaris of Fries, the M. rotundifolia of Dioscorides, loc. cit., and the Malache styly a Flavus, loc. cit.

M. borealis has its outer sepals linear, as long as the ovo- acut glutinous, the stamens with a strong, ciliated peduncle. For once, the petals as long as the calyx, the fruit subpunctatus, margined, reticulate-rugose. It is the M. purifolia of Smith, the M. rotundifolia of Fries. It is found in Britain, near Hythe in Kent.

There are many other species of M. malva which occur in the whole of the Northern Hemispheres. Those which are the only natives of Britain, and the others are of little importance excepting as ornamental plants. Those best worth cultivation for this purpose are M. Moschatia, Mornica, ake, M. rotundifolia, and Fries, the Malache styly a Flavus, in any kind of rich soil, and cuttings of them will strike root freely if planted in light soil under-neath a handglass. The greenhouse species may be propagated in the same manner. The hardy perennial
should be planted in the open border, and may be propagated either by seed or by dividing the roots. 

(Don, Gardner’s Dictionary; Babington, Manual of British Botany.)

Mandate, as one of the contracts of the Roman law, was constituted where one by special agreement, or by tacit assent, had undertaken to perform some act gratuitously for another. The obligations incumbent on the mandatory, and entitled against him by law, does not, from his receiving a consideration for what he had undertaken to do, but from his leading the mandatory to believe that he would perform it, and thus causing damage if he should neglect it, is distinctly from himself. Gesner too, in some the person performing the service undertakes it without authority from the person for whose behoof it is undertaken; and from Locatio-

Candida, the service of which is not actually performed. The characteristics of Mandats of Mandate are briefly stated in Heineccius, Ad Inst., tit. 27, and by Gaius, iii. 155, &c. In England mandate in this simple sense is a department of the law of Bailment. (BAILMENT, P. C.) In Scotland there is a wide departure from the old Roman meaning of the word, and almost every instance where one person acts for another is said to be under the contract of mandate; thus the commercial agent buying and selling, and the solicitor conducting litigation, are said to be ‘Mandatories.’ The case in which, by the practice of the law of Scotland, the word mandate in its old sense is best exemplified, is in trusts, which, instead of being subject to the compulsory jurisdiction of the sheriff courts, are, in England, are treated as mere simple mandates. The acceptor of a bill is held to be a mandatory of the drawer.

Mandragora. (Arrone, P. C.) B. No. I. Mandragora is a woody, perennial plant, and its roots are a good remedy. During the prevalence of pneumatic medicine, preparations of mandragoras, particularly the brown oxide, on account of the large quantity of oxygen it can yield, were much employed; but since the views of Beddoes, who recommended them, have become obsolete, the articles suggested to be used have fallen into oblivion. A rational ground for reviving some of them is to be found in the facts that oxide of manganese exists as a constituent of these roots, and that similar effects are obtained in these structures, and also that carbonate of manganese exists in some of the mineral springs of Carlisle and Mien- laden, and hydrochlorate of manganese exists in the waters of Kreuznach. The presence of these salts in waters much celebrated for their utility in various chronic diseases has suggested their employment in some of the complaints which are frequently benefited by them. But even if their curative properties are insufficient to establish them as valuable medi- cines, the deleterious effects of some forms of manganese justify a notice of them in this place. The extensive em- ployment of black oxide of manganese, in the preparation of black paint, has occasioned the spreading of the fable of a man in a form of paralysis which should be early noticed, inasmuch as it is now thoroughly established it seems altogether incurable; and the only chance for escape from the occupation is to limit paralysis of the lower extremi- ties, affecting the motor nerves only, for the sensibility is unimpaired. A staggering gait is the first symptom of its commencement, which is observed about 1500; the body may be increased by giving it with infusion of senna or with rhubarb. Alkalies and their carbonates are incompatible with it, as decomposition occurs. Its power of augmenting the secretion of the bile, and the prostration of the gastric juice, or a substitute for it where mercury cannot be borne. It is useful in goit.

Mangl. (Calvotberg, P. C. S.; E. K. T. J. Gardiner, P. C.)

Mania. (Ismay, P. C.; Luctay, P. C.; P. C. S.)

Manning, Robert, is more usually called Robert de Brunne. He owes this name to his having been a Gil- bertine Friar in the monastery of Brune or Bourne in Lin- cobshire. He lived in the reigns of Edward I. and his successor, and was the writer of one of the earliest of the Metrical Chronicles whose language can be called English. His work however is merely a translation from the French. It is in two parts: the first, translated from the Breton 'A'ntegre' and ‘Roman ne le Roi’ of Wace and Gaimar, begins with 'Zeanas and ends with Cadwallader; the second, from Cadwallader to Edward L., is translated from the Chro- nicle of Peter Langtoft. (Langtoft, P. C.) Robert's version was published by Hearne in 1725. The measure of it is octosyllabic in the first part, and Alexandrine in the second. Its poetical merit is very small; but it is interesting as an early monument of the language and valuable for its information, both historical and literary. Robert made in English rhymes a translation, which has never been printed, of Saint Buonaventura's 'Petisio et Passiones Domini.' He translated also, freely, into octosyllabic verse, the 'Manuel Pache,' or 'Manual of Sins,' which used to be attributed to Bishop Groux on insufficent grounds. Of this unprinted translation specimen are given in Barton's work and elsewhere. Hearne has supposed, with little reason, that Robert de Brunne was the author of the old English metrical romance called 'Rycharde Coer-de-Lyon.'

Mantua, the name of a family of artists of Mantua, of the sixteenth century. The property name seems to have been Ghiasi, but few particulars regarding the lives of its members are known.

Giovanni Mantuan, also Bertano, was painter, sculptor, engraver, and architect, and a contributor of a commentary on Vitruvius—Gli occhi e difficili Pastel dell’Opera di Vitruvio,' fol., Mantua, 1558. He was also a pupil of Giovanni Battista Griezzi, and was very active in engravings, and a few paintings; but his chief business was architecture, and he built the church of Santa Barbara a Mantua. It is not known what relationship he bore to the following artists.

Giorgio Griezzi, called Giorgio Mantuan, was born about 1520. He was painter, and engraver, and was still living in 1578. Bartch describes seventy-one of his engravings, and throws light upon the early and very important works of the sixteenth century; they are well drawn and executed with great mastery, much in the style of Marcantonio. Among the most valuable are the Last Judgment, and the Prophets and Sibyls, by Michelangelo, in the Sistine Chapel; and the Dispute on the Sacrament and the School of Athens, after the frescoes by Raphael in the Vatican.

Bartch describes 129 prints by Adalbert Griezzi, called also Manisano; and 46 by Diara Griezzi, called Mantuan. Those of the former are dated from 1566 to 1576, and those of Diana from 1576 to 1588. Diana was the daughter of Joasimiano, the friend of Francesco da Volterra, architect; the date of her death is given 1589.

(Gandellini, Notizia Italiane degli Intagliatori; Bartich, Peintre-Graveur; Brilliot, Dictionnaire des Monogrammes, &c.)

Manuel, Nicolaus, sometimes called Deutsch, a celebrated Swiss painter, was born at Bern, in 1484. He is the Emanuele Tedesco who studied under Titian at Venice about 1511, and he became one of the celebrated painters of forty-six subjects, forty-one of which were the actual Tode- tentzen; it has been long since destroyed, but the compositions are preserved in prints and copies: the wall on which it was painted was pulled down in 1660. Manuel was one of the painters who made the most of the opportunities upon the abuses of the Roman church; he was also a great politician; in 1528 he took an active part in an official capacity in the government of Bern. He died in 1590. His pictures are often seen in private collections in London and Bern. There are a few other of his oil pictures at Basel and at Bern.

Of Nicolaus Manuel, until recently, little was known beyond what Sundelius writes of him in his 'Teutsche Academie.' He appears to have been a man of universal ability; he was painter, sculptor, wood-engraver, poet, soldier, and statesman; and he was lately made the subject of an elaborate work by Dr. Grünlein. After the death of Manuel, Lehmann, Baur, Maders, Richters, Kriegers, Staatsmannes, and Reformerne, Stuttgart and Tubingen, 1837.

(Nagler, Neues Allgemeines Kirchent-Lexicon.)

MAPES, WALTER DE. [GEORGE OF MOSMOUTH, P.C.]

MAPES AND CHARTS. [Copyright, P.C. and P.C.S.]

MARCCELLUS, ULPNIUS, a Roman jurist, who lived under Antoninus Pius and his successors. He was employed by the Senate to draw up the "Decretum Gratian, a single book of Institutions, four books entitled Regularia, two books on Appellations, two books on Plebis Jusicia, a single book in the Digest, a single book in the Pandects, a single book in the Institutes.

MARCUS, CICERON, a Roman jurist, who died in the reign of Commodus, the successor of Aurelius, and by his military success excited the jealousy of the emperor. (Dion Cassius, lxxxii. 8.) But it is doubtful if this Ulpius Marcellus is the jurist. (See the note of Hainmarius on Dion Cassius.)

The writings of Marcellus mentioned in the Florentine Index are thirty-one books of Digests, six books on the Leges Julia et Papia, and two books of Bonsomen. There are 150 excerpts from Marcellus in the Digest; and other works of his are cited besides those just enumerated. Marcellus is quoted by Marciusius, Ulpianus, and Paulus frequently, and by others of a less importance. The dates of his birth and death are unknown.

MARCH, a market and post town in the champaign of March in the parish of Doddington, in the northern division of Withford hundred in the Isle of Ely, Cambridgeshire, 94 miles by road, 72 by the Eastern Counties Railway to Ely, and from thence 20 miles by coach-road through Chatteris to March. The area of Doddington parish is 39,840 statute acres, that of the champaign of March 20,440 acres; the population of the parish in 1841 was 8648, of whom 7076 were in the champaign of March. The population of the champaign at the former enumerations was, in 1801, 2014; 1811, 3069; 1821, 3950; 1831, 5177. The number of houses in the champaign in 1831 was 1024; inhabited, with 1212; inhabited, with 1028 families; 42 unhinherited and 16 building; in 1841 it was 1163 inhabited, 32 uninhabited, and 12 building. In these returns the town is not distinguished from the rural district of the champaign.

The town consists principally of two streets, in the form of the letter T: the street which forms the axis of the letter runs north and south, and is lined with houses on both sides; the cross street runs in an irregular line on the north bank of the old river Nea, having scarcely any houses except on the north side of the street, the south side being for the most part closely skirted by the river, which is crossed by a bridge at the entrance of the town. The church or churchyard, built in 1272, stands at the southern extremity of the town: it is dedicated according to some statements to St. Mary, according to others to St. Wendslea, and is said in some cases to have been erected in the Thirteenth century: it is a handsome Gothic structure, with a spire at the west end. There is a modern and commodious town-hall, where municipal courts are held. The establishment of the grammar school was established in the Isle of Ely for the recovery of debts under 10s. There is a weekly market on Friday for butcher's meat, and there are two yearly fairs. Some trade in agricultural produce is carried on by means of the river Nea, which is navigable.

The champaign of March is united with the vicarage of Doddington; the clear yearly value of the united benefices is 730.5s., with a glebe-house; they are in the rural deanery of Ely, and diocese of Ely. There were in the champaign in 1833 nine day-schools, with 552 children of both sexes, giving not one in nine of the population (according to the census returns) under daily instruction. Two of the schools, with 304 children, were national schools supported by various endowments, and attended by the children on Sunday also; and there were two other Sunday-schools supported by Disendowment with 177 children.

(Ordnance Survey; Parliamentary Papers; Lyons's Magna Britannia.)

MARCIANUS AELIUS, a Roman jurist, who was writing under Antoninus Pius and his successors. He lived near the tomb of the Emperor Divus (Dig. 50, tit. 4, 7). He also survived Caracalla, the successor of Severus, for he names him Divus (Cod. 9, tit. 8, 6). He probably wrote chiefly under the reigns of Septimius Severus and Caracalla, but the works of Marcianus which are mentioned in the Florentine Index are sixteen books of Institutions, four books entitled Regularia, two books on Appellations, two books on Plebis Jusicia, a single book in the Digest, a single book in the Pandects, a single book in the Institutes.

(Translation: "Ignium, nothing is known but one old mention and a quotation. A certain Grecius is mentioned (about A.D. 800) by the Arabic physician whose name is latinized to Menau. John Menau's medical works were translated into Arabic with some success. There is a surmise by Fabrius and Dutens, that this same Grecius is mentioned by Galen. His name first appears, as far as we can find, in Dr. Jebb's edition of Roger Bacon. In speaking (pre- dance, shrewdly) of the art of powdering, a sort of detonating powder, Jebb thinks he may have drawn his account from the Liber Ignium of a certain Marcus Grecus, of which he (Jebb) had seen a manuscript in the possession of Dr. Richard Mead. Dutens, author of 'The Origin des Découvertes attribuées aux Modernes,' procured the account from Dr. Jebb, and ascertained that there was a manuscript in the Royal Library at Paris. But the work has never been published, nor has any notice of it been taken of, that we can find, except such references to Jebb and Dutens as that made by Dr. Hutton. [Bacon, Roger, P.C.] As the passage in question is not easily met with entire, and certainly describes a compost of saltpetre and sulphur, we shall transcribe it, seeing that the early existence of some such thing as gunpowder is clearly indicated, not merely by the passage itself, but by Bacon's reference to it in a similar account:"

'Secondus modus ignis volatilis hoc modo conficitur: lib. ii. sulphuris vivi; lib. ii. carbonis malice; salis potosi vel libros, que tria subtillissimae terrae in lapide marmoreo. Paene salis ad libitum in tunicas repurpatur volatilis vel tonitrum faciens. Nota quod tunc ad volandum debet esse graciola et longa, et predicto pverlo optimo concutacto repleta. Tunc a vel tonitrum faciens debet esse brevissima, grossa, et predicto polvere sone malieta, et ab ea predicto repleta. Nota quod in qualitate tunicas primum foramen fationem est, ut tena imposito accedatur, ut tenea in extremitatis inferi graciola; in medio vero latas, et predicto polvere repleta. Nota quod ad volandum tunicas plascuras ad libitum liberat potest, tonitrum vero faciens quam plurimas plascuras. Nota quod duplex potest facere tonitrum ac duplex volatilis inveniendum, vel tonitrum solubilis in tunicas includendum.'

MARGARITONE D'AREZZO, a celebrated old Italian painter, sculptor, and architect, was born at Arezzo, about 1215, or perhaps a little later, but he was probably at least twenty years older than Cimabue, who was born in 1240.

Margaritone was a pupil of Cimabue, and had charge of the school, and of great reputation in his day. He executed many works in Arezzo, both in temples and in fresco; in the latter style, he painted the ceiling of the church of S. Stefano de Arzincoli, and the walls of the church of the Holy Cross in Arezzo, which was burned by the duke Cosimo de' Medici in 1517, to make room for improvements in the fortifications of Arezzo. Most of Margaritone's works were preserved; but one, which, according to Vasari, Margaritone adorned one of his masterpieces, namely, San Francesco, painted for a convent in Sarziano, still exists, and is engraved in Lastris 'Etruria Piranesii.' I. 7. Vasari speaks highly of a picture on canvas, illustrating the lives of the Virgin and John the Baptist, in small figures, and in which, says Vasari, Margaritone much surpassed his larger works; but this picture has also perished.

There is still an old painted woollen crucifix by Margaritone in the church of Santa Croce at Florence, where it is placed by the side of a similar work by Cimabue. Margaritone's fame was very great in his time, but it was almost wholly eclipsed by the superiority of Cimabue in the use of colour. He was a peculiar way of stretching and priming his canvases; they were primed with plaster mixed with size or glue made of strips of parchement, and were stretched and fastened with the same glue and with tacks.

In sculpture, says Vasari, Margaritone was more successful than in painting. There is still but in, in the cathedral of Arezzo, a reclining marble statue of Gregory X. over the tomb of the same cardinal, to which he was the principal architect. Gregory X. is seated in the chair of the papacy, covered with a long cloak, and in the attitude of prayer, with one hand on the book of the gospels. The lower part of the tomb is also Gregory's painted portrait, but this has been defaced by time: this monument, according to Vasari, is Margaritone's masterpiece.

As an architect, Margaritone conducted the building of the cathedral of Arezzo, some time after the death of Jacopo
a movement of the ruler M N, be placed in coincidence with the zero of the scale (in the middle of the length of the ruler), the triangle must then be moved along M N till the index a is (suppose at a') in contact with the number on the scale which expresses the number of feet in the perpendicular distance between the line drawn and the line A C.

If the triangle be then in the position A' B' C', a line drawn along its edge A' C' will be the line required; for it will be parallel to A C at a distance from it equal to the given number of feet on the natural scale. The reason is manifest; for imagine A'D to be drawn parallel to B C; then the triangle A' D is similar to A B C; consequently, since A A' is equal to the distance a' b' between the two positions of the index, A'D will be the same proportion to a A as b' a' bears to A B; that is, as A'C' to A C.

Lines may be drawn parallel to one another by means of the side B C of the triangle; and it is evident that the distance between them (E C' for example) will bear the same ratio to a A as B' C' to A C; and, therefore, if one of the lines be drawn through the point of contact of the other, the triangle must then be moved along M N till A C passes through the given point; then the line A'C' will be perpendicular to that line.

When lines are to be drawn parallel to one another at considerable distances, the edge B C is made to coincide with an edge M N of the rectangular ruler; and, both ruler and triangle being moved together till A C, then perpendicular to M N, coincides with the given line, the triangle is moved along M N till the same edge A C is at the required distance from the original line; when the line may be drawn.

Marquol's rulers have occasionally been formed and used in a different manner. Instead of one or several scales, a single scale on the ruler M N has been made to serve the purpose by means of several triangles in which the lengths of the sides have different ratios to one another. Thus, a scale of divisions would be made equal to one inch at an edge of M F, and if a right-angled triangle in which the hypotenuse is twice the length of one of the sides is used with it; on sliding the index of the triangle over each division, of about the same length, the triangle is brought to the longer side of the triangle will be the 4th of an inch; if the hypotenuse be four times the length of the shorter side, lines drawn contiguously to the longer side will, on sliding the index over one division of the scale, be equal to the 4th of an inch; and so on.
both occasions declined on private grounds to accept the offer. In June, 1797, John Marshall, Charles Cotesworth Pinckney, and Elbridge Gerry, jointly and severally, were sent to France as envoys extraordinary and ministers plenipotentiary. Marshall returned to America in 1798. In 1799 he became a member of Congress, and on the 19th of May, 1800, was appointed to the Supreme Court. On 18th January, 1801, he succeeded John Jay as chief justice of the United States, and from that time till his death continued to fill the office with disinterested patriotism for ability and integrity. In July 6, 1835, Philadelphia, to which he had gone from his residence in Richmond in Virginia, in hope that by medical advice and change of scene his declining health might be improved, he went; but in his coffin he went穿过了他最年幼的儿子在巴尔的摩，他的旅程去参加他父亲的死亡床。

Judge Marshall was the author of the 'Life of Washington,' originally published in London, in 4 vols. 4to, the first volume in 1804, the fifth in 1807. The work was criticized by the 'Edinburgh Review' (October, 1808) severely, but perhaps not unfairly, as having been swelled out to an unreasonable bulk by historical matter unconnected with the life of Washington; as containing no details of his private character and habits, which Judge Marshall had ample opportunities of knowing; as dilute and undiscriminating in narrative, and hence dull and lifeless in study. This charge seems not to have been thrown away. Marshall published a second edition of the work in 1832, compressed into two volumes, and greatly improved. The 'History of the American Colonies,' which in 1811 comprised the volumes of the original work, he had published in a separate form in 1824.

As a judge, it is admitted that he was one of the most distinguished that America has produced. Judge Story, who was twenty-four years his junior on the bench of the Supreme Court, wrote in 1828 an article in the 'North American Review' (vol. xii.), 'On the Public Services of Judge Marshall,' in which he says.—'Splendid as has been the judicial career of this eminent man, it scarcely possible that the extent of his labours, the vigour of his intellect, or the unerring accuracy of his learning, should be duly estimated except by the profession of which he was so great an ornament.'

Many of those eulogistic judgments which have cost days and nights of the most elaborate study, and for power of thought, of power of illustration, of variety, and elegant demonstrations, are justly numbered among the highest reaches of the human mind, find no admiration beyond the ranks of lawyers, and live only in the dusty repositories of their oracles.'

We emphatically say of Chief Justice Marshall that his master-mind has preceded in our deliberations and arrived at the results of cogency of reasoning, a depth of remark, a persuasiveness of argument, a clearness and elaboration of illustration, and an elevation and comprehensiveness of conclusion, to which none others offer a parallel.'

(Marshman, Joshua, D.D. [Skarnsor Missi on, P. C. S.]

MARTINO. [Memma di Martino, Simone, P. C. S.]

MARTY, SAINI, the easternmost of the Azores or Western Islands, and lies near 37° N. lat. and 25° W. long. It is about seven miles in length from east to west, and five miles in breadth from north to south, and contains an area of 36 square miles, or 27,000 acres. The island consists of a plain and an elevated district. The plain occupies about one-third part on the west side of the island, the other part being formed of an elevated ridge running from north-west to south-east, which rises to a double peak (Pico Alto) 1889 feet above the sea, and of which the sides decline on the north, east, and south to molar cliffs, about 200 feet in height, with which it terminates on the shore. The plain is slightly undulating, and like the higher tract cut by ravines, terminating in cliffs more than 100 feet high. The aspect of St. Mary is therefore on all sides bold, and the coast abrupt or precipitous, and surrounded by the usual accumulations of fallen masses.

The surface on the west side is much overlaid with stones, and bears a sparse vegetation of grasses and weeds. The most elevated parts of the other ground are covered with common heath and some other shrubs; on the east side only is there any land which is fit for cultivation. The cultivation is limited to wheat, Indian corn, potatoes, and beans and peas. There are few trees, but those of cedars, and those of oranges have been largely increased. Aloes and the prickly-pear cactus grow wild, and the Rocella tinctoria to a large size. Nothing is known respecting the climate of the island. There is much less rain in this island than in that of St. Michael's. The population, according to the census of 1840, was composed of 4666 individuals, of whom about one-half belonged to the smallest of the Azores, and the remainder were dispersed over the island in single farm-houses. There were then 2213 males and 2453 females. There are some public schools, established by government, but in 1840 they were only attended by fifteen-two pupils, all males. The course of education does not comprehend more than the elements of reading and writing.

The whole quantity of agricultural produce is comprised in about 2000 quintals, the produce of which is mainly consumed in the following articles: boxes of oranges, and a small quantity of wine, potatoes, beans, peas, and other articles. About one-half of the wheat and all the oranges are exported to St. Michael's. This product was raised under the care of her mother the Neupil, and the year is sterile. The greater part of the western plain is only fit for pasturage. There are about 2800 head of horned cattle, 3000 sheep, 1200 pigs, 600 goats, and 100 horses and asses. It was at an age to benefit by the instruction of Philippe commanded some of the most skilful artists in their several styles to attend upon her. Any Scheffer was her master in design and painting, Pierre Jean David instructed her in modelling sculpture, and Jean Baptiste Lemaire taught her drawing in water-colours. She was married to the Duke of Würtemberg in 1837, and she died at Pisa, in January, 1849, in consequence of injuries suffered from the ascendant fever, which then besat St Geniez.

She is said to have left numerous designs, and to have executed many beautiful drawings. Some of her works in sculpture have already acquired her a European reputation; among these her marble statue of Joan of Arc is the most popular. Joan is standing with her eyes fixed upon the ground in deep meditation, her arms are crossed upon her breast, and in her right hand she grasps her sword; her costume is that of a female and a knight combined. The original statue, now at Versailles, is of the size of life, but it has been copied in many materials and in many sizes. She executed also an equestrian statue of Joan of Arc at the moment when having slain an Englishman with her battle-axe: there is also a small model by her of the Death of the Chevalier Bayard. And in a chapel at Fontainebleau there are some windows painted after her designs. Many contemporary journals, French and foreign, celebrated the character and ability, and depicted the urniitute fate of this accomplished princess.

MARYGOLD. [Callsefchia, F. C. S.]

MASCARA. [Adriano, F. C. P., p. 390.]

MASCIE, L. (Lorenzo, Island mathematician), was born at Bergamo in 1750. His studies were at first directed to the languages and literature of Greece and Rome, and to these subjects he applied himself with unwearied diligence. At the age of five years he was appointed professor of humanity in the university of his native city, and he attracted some notice at that time by a poetical dissertation on what he called the false eloquence of the pulpit. He afterwards became professor of Greek in the university of Pavia; and,
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having taken orders in the church, he acquired the title of Abbé.

Bishop was not till he was twenty-seven years of age that he began the study of mathematics; but he rapidly acquired a taste for the sciences, which induced him to abandon his classical pursuits, and so great was his progress in this branch of the study, that he obtained professor of geometry in the college Mariano at Bergamo.

When the Revolution took place in the north of Italy, on the invasion of the country by the French, Mascheroni was chosen a member of the legislative body in the Cisalpine Republic; and soon afterwards he was sent to Paris to assist in the formation of the new system of weights and measures. He was at one time also engaged at Bologna, with other mathematicians, in the construction of a watch. He also spent some time in view of proving the rotation of the earth on its axis by the place at which a body struck the ground when let fall from the upper part of a lofty building.

Mascheroni published in 1804, a work entitled 'Sulle Curve che servono a delineare le Orec Ineguali degli Antichi nelle superficie Plane,' Bergamo, 1804; and in the following year, at the same place, a tract, also in Italian, on the Equilibrium of Vails, 4to. In this tract the higher branches of analysis are employed, and the investigations are extended to subjects beyond those which are treated in the works of the earlier writers on the applications of science to practical engineering. It contains also a number of problems in geometry.

'Geometria del Compasso,' in which are ingenious solutions of several geometrical propositions by means of a pair of compasses only; that is, by the intersection of circular arcs, without a straight line, and which is sufficient for finding points in lines perpendicular or parallel to, or making given angles with, a line joining two points whose positions are assigned; of determining a mean proportional between two lines; of drawing polygons in circles. There are also approximate solutions of problems, such as the duplication or multiplication of a cube, and the trisection of an angle, which require, in the usual method of operating, applications of the cubic sections or other curves.

Besides the mathematical works just mentioned, and a tract containing notes on Euler's 'Institutiones Calculi Differentialis,' Mascheroni published some verses which were addressed to the Countess Grismond, an elegy on the death of Borda, and a poem entitled 'Iavio di Dafni a Leasia,' in which he introduced a precise description of the objects contained in the museum. He afterwards directed the army in Italy, and, as a reward of his services, was appointed to the command of the army of Napoleon on the 18th of February, 1804, and were the real conquerors of the island, and which Mascheroni had the merit of placing in a new light.

(Biographie Universelle; Montucla, Hist. des Mathématiques.)

MASSENA, ANDRE, Prince of Exilles, Duke of Rivoli, and Marshal of France, was born at Nice, 6th May, 1758. 'Several of the French marshals,' says D'Arriécli, 'and the most famous—Masséna, for example—was a Jew; his real name was Massunis.' (Cormingy, ii. 203.) Left an orphan at an early age, his education was greatly neglected. He appears to have spent some years of his youth at sea with a relation who was a captain of a trading vessel, but having taken a dislike to a sea-going life, he abandoned it, and in 1775 entered the army as a private soldier in the regiment Royal Italian, in which one of his uncles was a captain. After a diligent discharge of his duties in that regiment for fourteen years, he only attained the rank of corporal, which, when he afterwards became marshal, he declared was the step in his military career which had cost him the most to gain. Discouraged by this slow promotion, he retired to his native city, where he remained for some time, and then accompanied the French revolution recalled him to his former profession, and he was appointed by the so-called of his fellow-soldiers to the rank of adjutant-major of the battalion raised in the adopt the title of Duke of Exilles, which was soon afterwards confirmed. In August, 1793, he was made general of brigade, and general of division a few months after. In the Italian campaigns of 1794 and 1795 he served under the generals Walleran and Schérer, and it was chiefly owing to his skill as a tactician that the victory was gained in the Battle of Legnano (August, 1794), and on the Col de San Gianni in 1794. It is asserted that Masséna has generally been attributed to the ability of the plans which the influence of his talents caused to be adopted. When Napoleon assumed the command of the army in Italy he employed Masséna in the most important, and the brilliancy of whose military conceptions he so justly appreciated, that he summoned him the 'favoured child of victory.' The scenes of his principal exploits were Montenotte (1 and 2 April, 1796), Montenotte (14 April), Castiglione (30 June—5 July), Arcola (15—17 Nov.), and Rivoli (9 January, 1797).

At the peace of Campo Formio, October 17, 1797, Masséna was sent to France to present to the Directory the ratification of the peace of the 14th of November. In February, 1798, he was appointed to the command of the army which, under General Béthisy, was occupying Rouen and the Papal States. His appointment to this office was equally disliked both by the French soldiers and the inhabitants of the subject country, for they both became the victims of that insatiable avarice which on every occasion characterized this general. The multiplied complaints which his disposition gave rise to at last obliged him to resign his command and to return to Paris. He there published 'Un Mémoire' in justification of his conduct, notwithstanding which he was left without employment till 1799, when the important command of the army of Italy was confided to him. In the direction of this campaign he evinced a military talent of the highest order. The memorable battle of Zürich (5th and 6th of June, 1799), in which he obtained the victory over Rossbach, who, with a very superior force, not only drove the English from the town and its environs, but also defeated the Austrians, was a signal victory for the French arms, and finally decided the event of the war in favour of the French, who, under the able leadership of the French generals, were now able to maintain their superiority over the enemy, and to make good their conquests.

In 1799, he was again appointed to the command of the army of Italy, and was ordered to advance under the Archduke Charles: he conducted this campaign with varying success, but he was at last enabled to drive back the Austrians into Germany, and to effect a junction with the French army of the Rhine. After the battle of the Nations (20th Oct., 1799), Masséna had the command of the army which was to conduct Joseph Bonaparte [Bonaparte, Joseph, P. C. S.] to Naples, which kingdom had been bestowed upon him by his brother (from whence he returned after having established by force of arms the authority of the new king). By his success over the insurgent Calabrians and the redaction of the fortress of Gaeta (18th June, 1800), he enabled Joseph to take possession of his new kingdom. In 1807 he was appointed to the command of the right wing of the army opposed to the Russians in Poland, and his services during this important campaign were rewarded by the title of Duke of Rivoli, in commemoeration of the skill and bravery which he had displayed in that celebrated battle (1797) [Rivoli, P. C. J.; a large sum of money was at the same time given him to support his new dignity.

A singular and untoward circumstance occurred on his return to Paris. He, who had exposed his person in so many battles without receiving a wound, had the misfortune to lose the sight of his left eye while on a hunting-party, a portion of shot having been put accidentally into it.

The Austrian campaign of 1809 shed considerable lustre on the already high military character of Masséna. He greatly distinguished himself at Landshut and Eckmühl. The rapid capture of the strategic castle of Klenau was memorable; from its position on the river Traun, was deemed almost impregnable, especially attracted the admiration of Napoleon. At the battle of Battle of Essling [Lannes, P. C. S.] the defence of the village of Aspern was confided to Masséna, and it is general}
Mason, who in engraving appears to have been self-taught, had extreme facility and certainty of execution, and he was one of the first artists who made a marked distinction in the textures of the objects which he engraved; he was also extremely successful in his mode of representing colour. The fantastic and fanciful manner in which he engraved his portraits, has been condemned by some critics as more brusque to display his own remarkable facility in handling the graver; in some heads the features are engraved in continuous and peculiar lines. He was very fond of playing his skill also in executing hair, whether of man or beast, though he frequently sacrificed truth to his propensity for making these fine lines, and in draperies and animals he has given it a flat, hard, and diverse effect. But this peculiarity is the most striking feature of some of his works. A print, after Titian, of the Disciples at Emmaus, is from the nature of the cloth on the table generally known as La Nappe, and there is a dog in the picture which is such a mass of hair, that upon a close inspection it appears, says Watelet, to be made entirely of straw; yet notwithstanding these peculiarities, says the same intelligent critic, this print is the best engraving after Titian. Watelet says that Mason's faults are faults which he would have, and that they are always compensated by his beauties. The print of the Disciples at Emmaus has an additional value beyond its merits as an engraving, for, with the exception of the praying bishop who is the Emperor Adrian IV, the other is the Emperor Charles V, the host is the emperor's confessor, and the attendant is Philip II. of Spain. Mason died at Paris, under the protection of the engravers in order to become a member of the French Academy of Printing. He has executed many portraits, several after his own paintings, and some of them are nearly of the size of life. Mason's portraits have a peculiar interest also as representing a group of the most distinguished men during the reign of Louis XIV. His historical pieces are not numerous, but they are all excellent.

Watelet and Levesque, Dictionnaire des Artistes; Robert Dumeznil, Peintre-Graveur Français; Nagler, Neue Allgemeine Künstler-Lexicon.

MASON. [MASON, SHIP-BUILDER, P. C.]

MASTER AND SERVANT. [SERVANT, P. C.]

MASTER OF A SHIP. [SHIPS, P. C.]

MASTERS IN LUNACY. [LUNACY, P. C.]

MASON, ABU-l-HASAN 'ALI BEN-HUSEIN BEN-'ALI, one of the most celebrated Arabian writers, was born, according to his own statement, at Baghdir, in the 6th century of the hejira, or the 9th of the Christian era. He belonged to the illustrious family of 'Abdallah-ben-'Ali-ben-Mastin, and was amongst the few early followers of Mohammed who accompanied the prophet on his flight from Mecca to Medina. Mason's life was filled with great talents, which he applied at an early age to the pursuit of science, and which was written in a spirit of such bitter invective that it produced a sensible effect on his mind and health, already enfeebled by bodily infirmities, and is said to have hastened his death, which took place at Cairo on Monday, 18th April, 1617. At his death, he was pronounced by General Thibault, was inserted in the Mémoire, and afterwards published separately.

Mason was gifted by nature with a powerful frame of body and indomitable resolution. His bravery was rather characterised by perseverance than by impecuniosity. He was considered the most skilful tactician among Napoleon's generals, and on the field of battle he was remarkable for the coolness and precision of his aim and for his penetrating insight into the intended movements of the enemy. He had moreover the invaluable quality in a commander of not being deflected by grief. His faults and vices we have already alluded to; they were principally rapacity and avarice, and they frequently brought down upon him the displeasure and punishment of his chief.

[Alison, vol. iii. p. 431. Les Cosa, Mémoire de St. Héron, Courtois and Camp of Napoleon: Dict. Hist. de Battailles; Biographie Moderne; et al., Mémoire sur la Compagnie de 1809, Paris, 1823-26, 4 vols. (accurate military writer was also editor-camp to Masséna); Napier, Hist. of the Peninsular War.]

MASON, ANTOINE. This celebrated French engraver and painter was born at Loury, near Orleans, in 1656, and was originally an armurer and damasquinier, damaser, damasquinier, and an engraver in metal, and an artist in much request in the days of armour and chivalry.

Mason, who in engraving appears to have been self-taught, had extreme facility and certainty of execution, and he was one of the first artists who made a marked distinction in the textures of the objects which he engraved; he was also extremely successful in his mode of representing colour. The fantastical and fanciful manner in which he engraved his portraits, has been condemned by some critics as more brusque to display his own remarkable facility in handling the graver; in some heads the features are engraved in continuous and peculiar lines. He was very fond of playing his skill also in executing hair, whether of man or beast, though he frequently sacrificed truth to his propensity for making these fine lines, and in draperies and animals he has given it a flat, hard, and diverse effect. But this peculiarity is the most striking feature of some of his works. A print, after Titian, of the Disciples at Emmaus, is from the nature of the cloth on the table generally known as La Nappe, and there is a dog in the picture which is such a mass of hair, that upon a close inspection it appears, says Watelet, to be made entirely of straw; yet notwithstanding these peculiarities, says the same intelligent critic, this print is the best engraving after Titian. Watelet says that Mason's faults are faults which he would have, and that they are always compensated by his beauties. The print of the Disciples at Emmaus has an additional value beyond its merits as an engraving, for, with the exception of the praying bishop who is the Emperor Adrian IV, the other is the Emperor Charles V, the host is the emperor's confessor, and the attendant is Philip II. of Spain. Mason died at Paris, under the protection of the engravers in order to become a member of the French Academy of Printing. He has executed many portraits, several after his own paintings, and some of them are nearly of the size of life. Mason's portraits have a peculiar interest also as representing a group of the most distinguished men during the reign of Louis XIV. His historical pieces are not numerous, but they are all excellent.
Mohammedism, Christianity, those of Zoroaster and Confucius, and the idolatries of barbarous nations. His geographical knowledge was no less extensive and correct than his acquaintance with history, and no Arabian writer can boast like him of the title of 'hierotamitardus,' in the words of the historian. In the introduction to Dr. Spranger's translation of the 'Golden Meadows,' Mas'udi is thus compared with Herodotus—'If it is the warmth for his own nationality and tenets without prejudice against what is foreign; the elasticity of mind to receive impressions, and to appreciate opinions, without want of firmness and principles; the thirst for correctness of information without preconceived criticism, which rejects in toto what is false, if it differ from known facts; the vastness of experience and deep learning acquired through extensive journeys, frequent intercourse with men of all nations and opinions, without neglecting that self-knowledge which is acquired in solitary self-contemplation and the basis of history (?); and if it is that extensive knowledge and enlarged mind which embraces all past, reflecting on the present; and that sound criticism, which, entering into the feelings of nations, and penetrated by those ideas, imaginations, and tendencies which mankind feel at all times, select what is national and characteristic although it may not always bear the stamp of logical reasoning; if it is for these reasons that Herodotus is called the Father of History, and of the greatest of all historians—El-Mas'udi has a just claim to be called the Herodotus of the Arabs.'—A characteristic feature of Mas'udi is his want of method in arranging his historical material. The 'Golden Meadows' are never failed to supply him with what he was writing. He illustrates the history or geography of the West with anecdotes or contrasts taken from China or Arabia; he avails himself of his powerful imagination; he has the power of surprising his reader with the stories of different Mohammedan sects; and while he informs the reader of the mysteries of the extreme North, he will all at once forget his subject and transfer him into the desert of the Sahara. In this latter respect, the book bears a strong resemblance to Gibbon's 'Decline and Fall.'

G. Niebuhr, although this peculiaritiy of the German historian is less apparent in his works than it was in his lectures.

The principal works of Mas'udi are: 1, 'Abhīdīrz-e-zemā,' or 'The Book of Knowledges;' 2, 'Abhīdīrz-e-marā'z,' or 'The Book of Emotions;' 3, 'The Book of the Middle,' the word 'āfāst; the plural of 'wast,' being probably taken in the sense of 'proportionate,' 'not exceeding a certain size.' This is the complement to No. 1, and treats of the most curious and important questions in history and geography. There is no MS. of it in Europe, and we know some of its details only through the quotations of some Arabic writers. Aware that his works were too voluminous, Mas'udi wrote, 3, 'Mordj- dhelwel el-mudd-un-al-jelwih,' his celebrated 'Meadows of Gold and Mines of Gems.' This is an extract with additions from No. 1 and 2. In the Leyden MS. perused by Dr. Spranger, the work is divided into 132 chapters, of which the doctor gives the titles in the introduction to the first volume of his translation of the work; in a Paris MS. it is divided into 129 chapters, 65 of which treat on foreign countries, and the remainder on the Empire of the Arabs. Mas'udi wrote, 4, 'Abhīdīrz-e-ākīdāt,' according to the author, for each chapter bears the date when the author finished it. This seems, however, scarcely credible. In a.m. 545 the author issued a second edition consisting of 7 volumes; this edition was more consonant, and met with less favour from the public than the first edition, of which there are many MSS. in the East as well as in Europe; but there is no MS. extant of the second edition. A Spanish Arab, El Shekhit, a native of Xativa, made an extract from the 'Golden Meadows,' and so did Reiske during his residence at Leyden. The 'Historia

The translation of the whole work, of which the first volume, containing the first seven chapters, translated by Dr. Aloys Spranger, with the co-operation of the late Earl of Munster, appeared under the title 'El-Mas'udi's Historical Encyclopedia entitled Meadows of Gold and Mines of Gems,' 1st vol., London, 1841, 8vo. The 'Golden Meadows' treat on the history, geography, religion, manners, and politics of most of the Eastern and European nations, and are full of matter both important and curious.

The following are works of Mas'udi, some of which are extant in MS., but most of them are only known by being quoted by other writers:—

3, 'Kitāb fonūn-al-m-riffī', &c., 'Different Branches of Science,' and of what has happened in bygone times; 5, 'Kitāb dekhāir-al-olūm,' &c., 'Treasury of Science,' &c.; 6, 'Kitāb al-m-eisāfī, &c., 'The Book of Questions on the Causes of Religious Differences'; 10, 'Kitāb sun-al-hāyāh,' &c., 'The Physician of the Soul,' with a metaphysical digression on dreams; 13, 'Haddās al-dāsār,' &c., 'Flora,' contains historical information on the descendants of Mohammed and their virtues; 14, 'Al-māšīfī we al-tādīkhī,' &c., 'On Principles and Compositions,' treats among other subjects on the influence of the sun and the moon; 15, 'Kitāb as-ṣabīrī ahsān al-mūdārī, &c., 'The Book on the Seventy Chapters,' treats on the policy of kings, and is a very remarkable work.
M A T

MACHII, in Gunnery, is a material employed in firing military mines or in discharging pieces of ordnance. Before the invention of fire-locks, hand-guns or small-arms were fired of matchlocks, one kind of which is still more efficient; and match-lock fire-arms are still used in some parts of Asia.

What is called slow-match is only a piece of slightly twisted hemp which has been soaked in a strong solution of saltpetre. When it has been thoroughly wet, and, if necessary, rubbed to it, it burns very slowly, and a piece one yard long is scarcely consumed in eight hours. In use, the end to which fire has been applied is blown upon by the breath, when it is capable of setting fire to gunpowder or to the cotton-wool inserted in the percussion cap, which will ignite a fuse.

The materials employed in the formation of quick-match consist of a mixture of saltpetre and melted gunpowder with some woollen thread, in which the saltpetre is put, is made to boil for an hour in a copper vessel, a wick of cotton being coiled in the liquid; the alcohol is then added, and the mixture is allowed to simmer over a slow fire for a quarter of an hour. Some of the powder is afterwards introduced, and the whole is kept during twenty-four hours. The cotton is then wound on a reel and the remainder of the powder is sifted over it. The match is then left for several days in order that it may become thoroughly dry, after which it is fit for use.

MATHAM, JACOB, a celebrated Dutch engraver and painter, was born at Haarlem in 1671. He was the pupil of Govert Flinck, and Matham's art was greatly admired by whom he acquired considerable fortune. Matham's prints are very numerous; Bartch describes nearly 300. He died in 1681.

(Bartch, Pinxsier-Gravers."

MATIC — Medical Properties of. This name is applied to a straggling plant brought from Peru, where it has long enjoyed a high reputation for its styptic properties. Doubts exist as to the botanical origin of the plant, some writers state it to be a Latin plant, resembling the Philodendron, while others refer it to a piperaceous plant, and even assert that it is the piper sauvignoni, Ruiz et Pavon, a native not of Peru, but also of Cayenne, and the Caribbean islands. The colour of the leaves, somewhat resembling a mastic, and the large quantity of volatile oil obtained from them, lend countenance to the former opinion; while the alternate position of the leaves in most of the specimens described, entirely negatives this notion. The probability is, that two distinct plants pass under the name of Maticor, which, though they have a distinct origin, have similar properties. Frequent instances of this are found in Brazil, where numerous plants are called capoeira; and several, reputed antidotes to the bites of serpents, are all termed capoeira. The analysis of the leaves seems to have been made on the piperaceous plant, which is stated to yield a drink employed by the Indians to cause effects similar to those obtained from the Cannabis Indica. This fact strengthens the idea of its being a piper, since the piper methysticum yields a highly intoxicating beverage. Maticor has been analysed by Dr. Fitch; it contains: 1, a yellow, dark-green resin; 3, a brown colouring matter; 4, a yellow colouring matter; 5, gum, and nitrate of potash; 6, a bitter principle, Maticor; 7, an aromatic volatile oil; 8, ashes; 9, lignin.

Cold water extracts, in about four hours, all the medicinal virtues of the plant, and is an eligible means of administering it. A tincture is also employed, and the powdered leaves are given both internally and applied externally. It does not owe its straggling properties to tannin: and it seems to exert a vital action on bleeding vessels, so as speedily to arrest the hemorrhage. It has been used to check other discharges, such as the profuse expectation and also the night-sweats of consumptive patients. Few drugs exert more than a temporary influence over these symptoms; but among such, Maticor seems well entitled to attention.

MATICOR/AIA, a genus of plants belonging to the natural order Composite, the suborder Cynobifere, the tribe Seneceiideae, and the section Anthemiade. It has a nearly flat involucre with an elongated conical receptacle; the fruit is baccate; and the pappus is either absent, or in its place there is a slightly membranous border.

M. Caminomura, Wild Camomile, has bi-pinnae smooth leaves, capillary simple or divided segments, solitary heads of flowers; it grows on open hills throughout Europe, on damp-hills, in cultivated ground, and on waysides and waste places. It was formerly used as a medicine, but its place has been taken by the common Chamomile and other plants of the same order. It is the Atheneic of Dioscorides, lib. 3, cap. 144. The Pyrfreither Parthenium, Fever-fever, is by some botanists referred to Matricaria. This plant is of the genus Matricaria, which contains the celebrated "Hart Plant," lib. 14, cap. 7, and the Harveya of Dioscorides, lib. 3, cap. 135; and of Plutarch (Sallia, cap. 13). Other plants, as species of Pararicia, Chrysocoma, &c., were called gypsi-

(Bartch, Manual of British Botany; Fuss, Synopsis Flora Plant. Classica.)

MAURICE, THE REV. THOMAS, was born about 1754, at Ashtead, near Epsom, and was educated at the Christ's Hospital school. After his father's death the family was impoverished by an unfortunate marriage of the widow: and his education proceeded irregularly till Dr. Parr, one of his uncles, was induced to take him as a pupil, and treated him with great generosity and kindness. At the age of nineteen he was entered at St. John's College, Oxford, whence he removed next year to University College. After taking his degree of B.A., he was ordained by Bishop Lowth; and he held for some time the curacy of the large parish of Woodford in Essex, which in 1785 he resigned for a chapel at Epping, in order to obtain a water leisure for study. Next year he married: but his wife lived no more than four years. He had already published a translation of the Ceditius Tyrannus, and several other volumes of poems: and he continued to publish many other volumes of poetry. He was afterwards a professor of Greek at the University of Oxford, and was chancellor of University College by his distinguished tutor Lord Stowell; and before removing to Epping he had begun to concentrate his attention on the history of India, for dealing with which he had received a free grant of one hundred a year. He was one of the first to address the East India Directors. The irreligious spirit of the French revolution, alarming Mr. Maurice's mind, induced him to remodel his first work after it was nearly completed, and the result of the improvements of one of its dissertations on the Hindu mythology. His Indian Antiquities began to be published in 1791, when two volumes appeared, in octavo: the rest were brought out at intervals, the completion of the work being mainly the result of the administration of Earl of Harborough; and the seventh and last volume appeared in 1797. Meantime he had undertaken his History of Hindostan, the three volumes of which, in quarto, were published in 1795, 1798, 1799; and a second edition appeared in 1821. In 1798 Earl Spencer presented him to the vicarage of Wormleighton in Warwickshire: next year he was appointed assistant librarian in the British Museum: in 1800 Bishop Tomline obtained for him the pecuniary assistance held by the poet Cowper: and in 1804 he received from the Lord Chancellor the vicarage of Cadham in Kent. His Modern History of Hindostan, in two volumes, appeared in 1802 and 1804. His views of the history of the British East Indies and attempts in verse, succeeded this work: and one of his last undertakings was his History of the Progress of Indian Literature, and Anecdotes of those who have written in the East Indies, in 1810. Of this, the second edition appeared in 1821, 1820, and 1822. Mr. Maurice died at his apartments in the British Museum, on the 29th of March, 1824.

MAURICNAS, JUUSNUS, a Roman jurist, who appears to have been writing in the time of the emperor Antoninus Pius, from an expression which he uses (Dig. 33, tit. 2, s. 203); he was therefore a contemporary of Galen. The only work of his that is mentioned in the Florineum Index is six books Ad Leges. There are four excerpts from Maurinianus in the Digest.

MAURY, JEAN SIFFREIN, Cardinal, was born on the 29th June, 1746, at Vezins, in the Vexin, of poor but respectable parents. He showed at a very early age a great disposition for learning, and, being destined by his parents for the ecclesiastical profession, he was placed at the seminary of St. Germain, at Avignon, in pursuance of his theological studies. At the age of eighteen he proceeded to Paris, in the expectation of earning a subsistence by the cultivation of his talents. Though he was without friends in that city, his first publishing some considerable views, most encouraged by this early success he took orders, and devoted himself to the study of popish eloquence. In 1772 an "Éloge" on Fénélon, which he published, was favourably received by the French Academy; and the cardinal of Fleury, who was familiar with the works of his disciple, gave him a prebend at the Abbey of St. Denis. He however soon returned to Paris, where he became very popular as a preacher. A panegyrist of St. Louis, which he delivered before the French Academy, and one of St. Augustine
before an assembly of the clergy, met with so much success that the abbey of Framonde in the diocese of Saintes was bestowed upon him by the king, Louis XVI., who likewise appointed him preacher to the court. In 1786 he became a member of the Académie des Sciences, Letters, and Arts of the unfortunate Louis XVI., and continued a prominent part in the debates. From the first he enlisted himself on the aristocratic side, where his energetic eloquence and peculiar talent at reply rendered him a formidable antagonist to M. de Mirabeau. The oratory, which he expressed opinions hostile to the great majority of the assembly, was often listened to with admiration and greeted with applause. His great moral courage and firm adherence to the principles which he had adopted secured for him the respect and esteem of the more enlightened portion of his enemies. Opposed in debate by Mirabeau, Barnave, and Clermont-Tonnerre, he interposed at every step by the bises or cries of one or two thousand spectators in the galleries; certain of being defeated in all his efforts by an overwhelming majority; in danger of being stoned, strung up to the lamp-post, or torn to pieces at the close of every interesting debate, he still continued to speak, his voice was not deviated from his duty, but was ever to be found at his post. A true soldier of the church, he threw himself with undisguised valor into the breach, and it was hard to say whether he was the defender or the confessor of the king. The battle of declamation, the cutting force of his sarcasm, or the inexhaustible resources of his knowledge, were most conspicuous. (Allison, History of Europe, vol. i. p. 590.) On the 27th of November, 1787, he was appointed to the sees of Montfiascone, by which every ecclesiastical kingdom was required to take an oath to maintain all his power the new constitution; and in case of any priest's refusal, it was declared that he should be held to have renounced his benefits. To this constitution the pope had refused his sanction, on account of its hostility to the interests of the church, and the oath was indignantly refused by the majority of the clergy. When the day arrived for the taking it by the bishops and clergy of the Assembly, an infuriated mob surrounded the hall, threatening death to all who should refuse. On this occasion also Maury displayed his usual intrepidity, and boldly advocated the independence of his order. Strike, but hear me," was his explanation, when the last efforts of his impassioned eloquence in that Assembly were interrupted by the incessant cries of his political antagonists. At the close of the stormy session of the National Assembly, Maury, who could lend no further aid to the prostrate cause of royalty and religion, quitted his native country, and, at the invitation of M. de Mirabeau, went to Suaraworle, and he soon afterwards received with the highest distinction, and the loss of his beneficences in France was more than compensated by his speedy elevation to the highest situations in the Roman church. In 1789 he was consecrated Bishop of Châtillon, and afterwards appointed apostolical nuncio to the diet held at Frankfurt for the election of the emperor Francis II. This mission accomplished, in 1794 he was elevated to the dignity of a cardinal, and was instituted to the united sees of Montfiascone and Corneto.

On the invasion of Italy by the French in 1798, though every effort was made to seize Cardinal Maury, he escaped under disguise to Venice, where he assisted at the conventual election for Pope Pius VII. In 1799 he returned to Rome upon the conquest of Italy by Suaraworle, and was accredited as ambassador to his native city, Louis XVI. He was domiciled at Monte Maitre. This office he resigned on the reconciliation of the church of Rome with the government of the French in November, on which occasion he addressed to the First Consul better counsels than those of the party who had sided with so much personal hazard. Napoleon gladly received the proposal of a reconciliation with so distinguished a member of the church whose establishment he had been seeking in France; an interview was accordingly fixed between them at Grenoble, and in May, 1806, Maury reappeared at Paris. The flattering reception he there met with was calculated to attach him to the interests of this chief, who admitted him to his intimate circle, and himself of his counsels in ecclesiastical matters. He received the pension assigned to the dignity of a French cardinal, and was appointed First Almoner of Jerome Bonaparte. In 1807 he was elected a member of the Institute in the place of Targi, one of the advocates of the Cessation Law. The Archbishop of Paris subjected him to the displeasure of Pius VII., between whom and Napoleon there had arisen much disagreement. Cardinal Maury was a warm and sincere admirer of the emperor, and he not only expressed his cause in the disputes with the head of the church, but took every occasion, which the frequent victories of this chief afforded him, of testifying his gratitude by the expressions of his feelings. In his raptures of enthusiasm, he was soon so much attached to the emperor that he considered himself as the protector of his diocese. These mandates, written in a style of the most florid eloquence, do not remind us of the impressive and energetic orator of the National Assembly; they were severely criticized by the adherents of the ancient régime and by the witty frequenter of the Parisian saloons, who styled them 'archiepiscopal dispatches,' in allusion to their military tone, and their imitation of the style and manner of Napoleon's bulletins.

After the capitulation of Paris on the 80th of March, 1814, Maury was deprived by the Bourbons of the administration of his diocese; and in their resentment for his adherence to Napoleon's fortunes, he was deprived of his power and his church was transferred to the king of Rome. In the retreat on Paris, 1814, the Pope rewarded him for his firmness and powerful support of their tottering throne. He then returned to Rome, where he was imprisoned during one year by the orders of the pope; he was afterwards allowed to live gratis, to receive a pension, and was rewarded after his liberation. He was the author of a treatise upon Sancho, and his relations of the Pope's residence in the castle on the height of Monte-Soracte. In this retreat, deeply affected by the ingratitude of his former party and of the pontiff, to whose elevation he had been instrumental, he did not waver in his renunciation in regard to his own person, his relations, and his property. "Notwithstanding his extraordinary eloquence," says the Duchess of Abrantes, who knew him intimately, the Abbé Maury had been before the Revolution what he was in prostration, what he continued under the empire, a man of talent rather than a man of sense, and a curate of the time of the League rather than an abbe of the reign of Louis XVI. He added that he found himself in the long and disagreeable, but the description she gives of it appears rather a caricature than a portrait. His principal work, Essai sur l'Eloquence de la Chaire, 3 vols., 1805, published after his death by his nephew Louis Siffrein Maury, still maintains its well-merited popularity. His mind was formed to appreciate the eloquence of Massillon, Bossuet, and Bourdaloue, and his criticisms on the French divines are in general as correct and as severe as they are elaborate. In his review, however, of English pulpit oratory he manifests a want of acquaintance with the writings of our most celebrated preachers, such as Jeremy Taylor, Shielock, and G. W. Blunt, and he appears as a living proof of the comparison which he draws between him and Massillon is necessarily most unfavourable to the former. His own Panegyric of St. Augustine is esteemed one of the finest of his eloquence; he writes it conjointly with l'Abbé de Boismont, to be the author of a work entitled ' Lettres sur l'Etat actuel de la Religion et du Clergé de France.' There is a notice of the life of Cardinal Maury in ' L'Ami de la Religion et du Roi,' vol. xii. (Biographie Nouvelle des Contemporains, vol. xiii.; Allison, Hist. of Europe, vol. i.; Mémoires de la Duchesse d'Abrantes; Biographie Universelle Classique, Deuxième Partie, Paris, 1839; Biographie Moderne, vol. ii.; and a curious work entitled Dictionnaire des Girondins, Paris, 1815, in which are fully detailed the political variations of the most remarkable characters of the Revolution and the empire, though sometimes with more sarcasm than truth.)

MAXIMUM IN MACHINES. In all machinery there are certain relations between the moving parts and resistances which are to be overcome, which render the effect produced a maximum with respect to quantity of motion or velocity, which are the time of the performance a minimum.

In investigations relating to this subject it is usual to consider that in every machine there is a certain point at which, if the moving power were immediately applied, and a certain point at which the resistance to be overcome were immediately applied, the effect which is produced by the machine in its actual state. Thus, in a machine consisting of several wheels and axles with which weights are raised by means of ropes passing over their circumferences, the points at which the weight is most immediately...
connected with the moving power and resistance are tangents to the circumstances are those at which the forces are conceived to be applied. Also, if several forces act at once as moving powers, and resistances are to be overcome at once at various points, the resultant of all the forces and that of all the resistances must be taken for the effective moving power and the effective resistance. The points of application of these resultant forces are to be found, and at these points such resultant forces are to be conceived to be applied; the effects of friction, the rigidity of ropes, and every other impediment to the action of the machine, are also to be estimated and applied as additions to the resistance which is to be overcome; and thus a complex machine is reduced to an equivalent mechanical power of a simple form. The velocities of the points at which these resultant forces are conceived to be applied are equal to the velocities of the power and resistance.

The motion in machines may be of two kinds. On the application of force to a machine previously at rest a certain movement is induced, and this movement for a time is accelerative; but in some machines, after a while, the resisting power and the friction of the materials destroy the acceleration, when, unless the machine is subject to variations of force, is as the case with those which are impelled by wind or by the force of men or animals, the movement will become uniform. On the other hand, there are machines which are acted on by a constantly accelerating power, as when a weight at one end of a rope passing over a wheel descends from an elevated place and raises a weight attached to the other extremity.

If the velocities of the points of application of the equivalent forces are uniform, a simple equation will express the dynamical equilibrium of the machine; for, representing the moving power, and V the velocity with which it moves, or the force of resistance and v its velocity, we have in the case of equilibrium

$$FV = fV$$

the first member of the equation is frequently designated the momentum of impulse, and the second the effect produced by the machine.

But the effect of a moving power on a machine in motion is different from that of an equal power on a machine at rest; for the effect produced by any constant power in the former case depends upon its relative velocity, or the difference between its own velocity and that of the machine, and, by Dynamics, is invariable with the square of the relative velocity. Therefore, in order to introduce the absolute effect of a force into the equation of equilibrium in place of the efficient force, there must be given the velocity which would render the force quite ineffectual, as well as the actual velocity of the point of application: let the former be represented by \(V'\), and the latter by \(V\); then \(F\) representing the absolute force when the velocity is zero, and \(F'\) the actual force when the velocity is \(V\) \((F'\) being determined by the weight or resistance which is just sufficient to prevent the power from communicating motion to the machine, and \(V'\) the velocity with which the machine can move when the resistance is zero),

$$F' : V' :: F : (V - V')$$

whence

$$F = F' \frac{V'}{V - V'}$$

Then the first member of the equation \(FV = fV\) becomes

$$F' \left(\frac{V'}{V - V'}\right) = V'$$

or, putting \(v'\) for \(V' - V\), which gives \(V = V' - v'\), it becomes

$$F' \left(\frac{v'}{v'}\right) = (V' - v')$$

Now, in order to find the velocity which is consistent with the production of the greatest effect by the machine, this expression, which represents the equivalent of \(f\), the effective action of the machine, is to be a maximum; therefore, differentiating that expression, \(v'\) being the variable, and making the result zero, we have

$$2V' - 2v' = 0$$

and, substitution, \(V = \frac{1}{3} V'\).

Hence, if the resistance opposed to the machine is susceptible of being varied, it should be rendered such that the velocity \(V\) of the point of application of the equivalent force is one-third of the greatest velocity \(V'\) which the power can produce if unresisted. Substituting this value of \(V\) in the above equation for \(F\) we get \(F = \frac{4}{9} F'\); therefore \(F\), the momentum of impulse, or the effect of the machine, becomes \(\frac{4}{9} F'\) when that effect is a maximum, the resistance remaining unaltered.

If two bodies are connected together by a flexible line (supposed to be without weight) passing over a pulley at the common summit of a doubly inclined plane, the parts of the line being parallel to the surfaces of the two planes; the relation between the weights may be determined so that the momentum of that which is to be raised by the descent of the other may be a maximum. Let \(p\) and \(w\) be the weights of the bodies, or the forces of gravity acting on them vertically, and let \(\theta\) and \(\theta'\) be the respective inclinations of the planes on which they are placed, to the horizon; then \(p\sin \theta\) and \(w\sin \theta'\) are the forces of gravity on the planes, and consequently

$$p\sin \theta + w\sin \theta' = \frac{p + w}{p + w}$$

is the accelerative force by which \(p\) descends.

Now, by dynamics, the velocity of a body varies with the force and time; therefore, \(v\) representing the velocity of \(p\) or \(w\), and \(t\) the time of motion,

$$v = \frac{p\sin \theta - w\sin \theta'}{p + w}$$

and consequently the momentum \(m\) varies with

$$p\sin \theta - w\sin \theta' = \frac{p + w}{p + w}$$

this expression to be a maximum; therefore, differentiating it, \(v\) being the variable, and making the result equal to zero, the value of \(w\) may be found in terms of \(p\) by a quadratic equation; thus the required relation may be obtained.

If it were required to find, in any machine which when reduced to its most simple state may be considered as a lever or a wheel and axle, the ratio of the velocity of the moving power to that of the resistance to be overcome when the latter is a maximum, the following process may be used.

Let the arms of the supposed lever, or the semidiameters of the supposed wheel and axle, be represented by \(r\) and \(r'\), the power \(p\) being applied at the extremity of \(r\), and the resistance \(w\) at that of \(r'\). By the nature of the lever, \(p = w\) in the case of equilibrium; therefore, when the power is such as to produce motion, the motive force may be expressed by \(p'\) or \(w'\) and if applied at the extremity of \(r\). Now, in order that the momentum of inertia of \(w\) at a distance \(r'\) from the fulcrum may be made equivalent to the momentum of inertia of a body at a distance \(r\), on representing such body by \(p'\), we have \(p' = w' = \frac{r}{r'}\); whence \(w' = \frac{p'}{r'} = \frac{p}{r}\); the whole inertia to be overcome, if applied at a distance \(r\) from the fulcrum, will therefore be \(p + w\) and the accelerative force at the extremity of \(r\) will be

$$\frac{p + w}{r}$$

But, by dynamics, the velocity of a body varies with the force and time; therefore, representing the velocity at the end of the arm \(r\) by \(v\),

$$v = \frac{p + w}{r + r'}$$

and, in order to obtain the velocity at the end of the arm \(r\), the expression for \(v\) must be reduced in the ratio of \(r\) to \(r'\); therefore the velocity at the latter extremity varies with

$$\frac{r'p + w'r}{r'p + w'r'}$$

This expression is to be a maximum; therefore, on differentiating it, \(r'\) being the variable, and making the result equal to zero, there will be obtained the ratio of \(r\) to \(r'\) (which is the same as that of the velocities of \(p\) and \(w\)) consistently with the condition that the velocity of \(w\) is a maximum.
MAXIMUS, RUTILIUS, a Roman jurist, whose period is uncertain, but he probably wrote under Severus and Caracalla. The only work of his mentioned in the Florentine Index is Ad Legem Fuldalidum, or a commentary on the Lex Punicorum Servillian (Parker, 126). There is one excerpt from Maximus in the Digest. Q. CORNELIUS MAXIMUS, a contemporary of Cicero, was the master of C. Trebatius Testa, the friend of Cicero and Epicurus. He was born to two plebeian parents (Liv., xii; Suet., Aug., 2, 4, s. 45). There is no excerpt from his writings in the Digest, but he is once cited by Alfenus Varus (Dig., 33, tit. 7, s. 16), who prefers his opinion to that of Servius on the question that has been involved with the "instrumentum," the word "instrumentum" comprised the rakes, spades, poles, and stakes.

MAY-FLY, the popular name of the Neuropterous insects of the genus Ephemerides and its allies. [Ephemerides, P. C. S.] Boeis (referred to Mayfly in P. C.) is one of the genera of Ephemerides. The Boeis venomosus, an insect inhabiting a great part of Europe, is the type.

MEAR, SIMON, a composer of great repute during the later part of the last, and early in the present century, was born in Bavaria (at Sandersdorf, in 1760, according to Gerber; at Meersburg, in 1768, as stated by Lichtenhahn), and at an early age sent to study music in Italy; in which country he passed the greater portion of his life, and died his last breath. In 1802 he was chosen as Maestro di Capella to the church of Maria Maggiore in Bergamo. In 1799 appeared in Boeis' name the title of the Boeis Pestis, and in 1800 the title of the "Il Fanatico per la Musica." In 1802 he produced his "Misteri Eletasini," which on the Continent has always been regarded as one of the first class, though we believe it never reached this country. Boeis has prepared the way for the reception of Mozart's compositions in Italy, by the introduction of richer harmony and fuller and bolder accompaniments. In 1808 he brought out, at Vienna, "L'Equivoco," an opera buffa; and in the same year 'La Ginevra di Scocia,' founded on the episode of Ariodante, in the "Orlando Furioso," which yet possesses the Italian lyric stage. Boeis' Elisabetta, a "Alessandro ed Adesilia," and "La Rosa Bianca, e la Rosa Rossa," the subject of the latter from the history of our wars of the Red and White Roses. But the greatness of his conceptions, and the most striking proof of the energy of his mind, are evidenced in his serious opera, "Medee," first made known in London by Madame Pasta, whose personation of the Sorceress of Colchis was by all acknowledged to be one of the finest histrionic efforts that any stage in any country had exhibited, and who did no less justice to the vigorous music of the composer than to the classical taste of the poet, the living and well known Signor Rosetti, who built his drama on the foundation of this great work.

The bold determination of Mayer (and also of Paer) to draw more effects from the orchestra—to give to his compositions a higher colouring, as well as deeper contrasts of light and shade, than has been done before—by no means at first with much opposition from the studious non-professionists, and, through their influence, from the public generally. But the enlarged powers of the art thus obtained soon became apparent, overcame all resistance, and the Italy of our day adds another to the numberless instances of one extreme passing into its oppoite; for the clausure of all kinds of braying instruments at present supplies the want of invention, even more than in playgarden. Hence what Grevy unjustly and captiously, if not unjustly, said half a century ago—that Mozart placed the statue in the orchestra, the pedestal on the stage—may now with the strictest propriety be affirmed of real music. In addition to that the statue exhibits nothing but distorted features and false proportions. Mayer died December 2nd, 1845.

MAY-TREMSH (Mrs., F. C.)

MAYNE, JASPER, was born in 1604, in Devonshire. After having continued at Westminster school till nineteen years old, he was entered as a scholar of Christchurch, Oxford; and in 1631 he commenced M.A. Taking holy orders, he became the chaplain of Bishop Willoughby of Durham, and was at two livings in the neighbourhood, continued to reside in the university. He was created D.D. in 1644. Firmly de
to his duties, he was the coadjutor of his bishop in the see of Durham in 1648, and soon lost both of his vicarages. But his spirit was unbroken; and in 1659 he held a public disputation with a noted Anabaptist preacher. Afterwards he resided, till the Restoration, as chaplain in the family of the Earl of Devonshire. In 1660 he was restored to his livings; he then became chaplain in ordinary to the king, a canon of Christ
curch, and archdeacon of Chichester. He died at Oxford, in 1672, and was buried in the aisle adjoining to the choir of Christchurch. The following is a list of his pamphlets, in a part of a part of Lucian's Dialogues; and also several sermons and scattered poems. But he is now remembered only through the humour which marked his conversation, and which gave him the title of "The Old Cicerone." (1. The Old Cicerone; 2. The Old Cicerone, folio, 1668, 4to.; 1669, 8vo.; and in the ninth volume of Dodsley's Old Plays; a work considerably more amusing than decorous, and especially lively in its satire on the Purrism (wine); 2. The Amorous Warre, a tragi-comedy," 1644, 4to.)

MAZZOLINI, LODOVICO, a celebrated painter of Ferrars, sometimes called Lodovico Ferrarese, was born about 1481. Mazzolino, like several other distinguished painters not Florentines, owing to the silence of Vasari regarding them, has only recently received his due meed of praise. His name is sometimes confounded with Mazzolino, a name given by Lomazzo to Parmigianino, as the diminutive of Mazzolino, and Vasari has noticed him slightly under the name of Malini, whence, says Lanzi, he has been divided into two—Malini and Mazzolino, and treated as two distinct scholars of Lorenzo Costa, instead of one and the same; an error which has been corrected by Baruffaldi, the historian of the Ferrarese painters, who appears to have had very imperfect knowledge of him. Mazzolino was nevertheless, in pictures of small dimensions and small figures, of his finest works, considered by the great Italian painters. His works are miniature altar-pieces, and are excellent in colour, light and shade, and expression; and even in composition they are equal to those of their style, the symmetrical. They are on the whole little inferior to the small works by Garofalo. Mazzolino generally painted architectural backgrounds, and these are remarkable for the beautiful detail of the ornaments and figures in baso-relievo which are introduced into them. He died at Ferrars in 1530.

The works of Mazzolino are not numerous. There are several in the Ditchfield Gallery at Dover, and four in the Gallery of Berlin, among which is a valuable large picture on wood, of Christ disputing with the Doctors; it is marked MDXXIV. Zonar Lodovicii Mazzolins Ferrarimuthus. There are two also very characteristic works of this master in the National Gallery, in London; and two in the Gallery of Bologna. Besides these, there are very few authenticated works by this painter, many being no doubt ascribed to other masters, especially to Ghirlandajo, as is the case with a beautiful Nativity in the Florentine Gallery.

(Lanzi, Storia Pittorica, &c.)

MECCA, the birth-place of Mohamet, and the holy city of the Mohammedans, is situated in the part of Arabia which is called El Hedja or Hedj, about 21° 30' N. lat. and 40° 20' E. long., and seventy miles from the Red Sea, in a straight line.

This city is situated in a narrow and sandy valley, the main direction of which is from north to south. The breadth of the valley varies from one hundred to seven hundred paces: the chief part of the city is placed where the valley is widest. In the narrower part are single rows of houses only or detached shops. The town itself, or that part where the houses are contiguous to one another and constitute one mass, covers a space of about fifteen hundred paces in circumference, not the whole extent of ground comprehended under the denomination of Mecca amounts to three thousand five hundred paces in length. The mountains enclosing the valley are from two to five hundred feet in height, and the valley extends gently towards the south. Most of the town is situated in the valley itself, but there are some parts built on the sides of the mountains, especially on the eastern chain. The streets of Mecca are in general broader than those of eastern cities, the houses lofty and of stone, and the numerous windows that face the streets give them a more lively and European aspect. The houses present few windows towards the exterior. Many houses are three stories high. In most towns of the Levant the narrowness of the streets contributes to their coolness, and the frequent use of high carriage is not used, a space that allows loaded camels to pass is considered sufficient. In Mecca it was necessary to leave the passages wide for the visitors who crowd here.

The only public place in the body of the town is the large

2 N 2
square of the great mosque, which is only culverned during the Hadj (Pilgrimage) by the great number of well-stored shops. The streets are all unpaved, and in summer the sand and dust are as great a nuisance as the mud is in the rainy season, during which they are scarcely passable after a shower.

Mecca is badly provided with water; there are few cisterns for receiving rain, and the well-water is too brackish, except for culinary purposes, though during the time of the pilgrimage the lowest class of hadjis drink it. The famous well of Zouzem in the great mosque is indeed copious enough to water a town, but the water is not well tasted, and there is no well enough north to supply the women and children. The best water is brought by an aqueduct from the vicinity of Arafat, six or seven hours distant. This aqueduct is wholly built of stone, and all those parts of it which appear above the ground consists of a thick cover of stone and cement. There are two places in the interior of Mecca where the aqueduct runs above ground, and in those parts it is let off into small channels or fountains, at which some slaves of the sheriffs are stationed to exact a toll from persons who fill their water-skins.

All the houses in Mecca except those of the principal and richest inhabitants are constructed for the accommodation of lodgers, and divided into numerous separate apartments, each consisting of a sitting-room and a small kitchen. Since the pilgrimage has begun to decline, numerous buildings in the outskirts have fallen into ruin, and in the town many houses are in decay. Excess of population seems to have been the cause of their ruin. Some are moated by a ditch, which is said to have belonged to the sheriffs, two mechness or colleges, and the mosque. Mecca has no public edifices, and in this respect is perhaps more deficient than any other Eastern city of the same size. Burchhardt was told that the want of splendid palaces in Mecca is not due to the want of means. The great revenue from the pilgrimage and the jizyah is largely devoted to the veneration which the inhabitants entertain for their temple, and which prevents them from constructing any edifice that might possibly rival it.

Mecca is entirely separate from the Kaaba, which is only removable; for there are several mosques in other places of the East nearly equal in size and superior in beauty. The Kaaba stands in a small square, and is surrounded by colonnades; on each side there are four rows of pillars and on the other sides only three. They are united by pointed arches, every four of which support a small dome, plastered and whitened on the outside. The number of these domes is one hundred and fifty-two, and that of the pillars is variously stated at four hundred and fifty and five hundred. The columns are from one foot and a half to one foot and three-quarters in diameter, and above twenty feet in height, but otherwise there is little regularity in them. No two columns are exactly alike. The capital of these columns is of stone, and is deeply indented; on the lower part there is a circular arch and a column of stones meeting it. The whole area of the Kaaba is covered with a roof of the same material as that which surrounds it. There is a descent of eight or ten steps from the gates on the north side into the platform of the colonnade, and of three or four steps from the gates on the south side. Towards the middle of this area stands the Kaaba, which, according to the belief of the Mohammedans, was constructed in heaven two thousand years before the creation of the world, and Adam, the first believer, erected the Kaaba upon earth on its present site, which is exactly below the spot which it occupied in heaven. It is an oblong massive structure, eighteen paces in length, fourteen in breadth, and from thirty-five to forty feet in height. It is constructed of the great stone blocks of dimahat, joined together in a very rough manner and with bad cement. It stands upon a base two feet in height, which projects a sharp inclined plane. As the roof is flat, it has a distance of the approach to a perfect cube. The only door which leads into it is opened only two or three times in the year; this door is on the north side and about seven feet above the ground; it is entered by wooden steps. At the north-eastern corner of the Kaaba, near the door, is a head of stone; it forms a part of the sharp angle of the building, and is five or five feet above the ground. It is an irregular oval, about seven inches in diameter, with an undulating surface, composed of many smaller parts, and of various colours and shapes, well joined together with a small quantity of cement and perfectly smoothed. Every pilgrim kisses this stone. As its surface has been much worn by the kisses and touches of the people it is difficult to determine the nature of the stone. It appeared to Burchhardt to be a lava, containing several small extraneous particles of a whitish or of a yellowish substance. The colour is now a deep reddish brown approach to burnt ochre, though the surface is not well polished. The four sides are covered with a black silk stuff, hanging down and leaving the roof bare. This covering is renewed annually at the time of the hajj, and is brought from Cairo, where it is made at the express command of the Viceroy of Egypt. It is supposed to produce the wavering of the covering. Seventy thousand angels have the Kaaba in their holy care, and are ordered to transport it to Paradise when the trumpet of the last judgment shall be sounded.

There are several other buildings within the area of the mosque, mostly appropriated to reading rooms, prayer-chambers, or the performance of devotions. The Zouzem, or holy well, is supposed to be the spring found in the wilderness by Hagar, at the moment when her infant son Ismael was dying of thirst. It seems probable that the town of Mecca owes its origin to this well; for many miles round no sweet water is to be found, and the inhabitants are said to have purchased copious a supply. It is enclosed by a square building of massive construction, with an entrance to the north opening into the room which contains the well. This room is beautifully ornamented with inscriptions, and the air is invigorating. It is joined to the outer court, but having a separate door, is a small room with a stone reservoir, which is always full of Zouzem water; this is the hajjis get to drink by passing their hand with a cup through an opening in the roof, which serves as a window. This, into the reservoir without entering the room. From before dawn till midnight the room is constantly filled with visitors. It is considered a miracle that the water of this well never diminishes, and the continual draught from it. Burchhardt learned that the water flows at the bottom of the well, and that it is supplied by a subterraneous rivulet.

The revenue of the mosque is considerable, there being few towns or districts of the Turkish empire in which it does not possess property in land or houses; but the rest of this property is often withheld by the provincial governors, or at least it is reduced by the hands through which it passes, to a small proportion of its real value.

The inhabitants of Mecca, with few exceptions, are Arabeans from different countries; but they have amalgamated, and they wear the same sort of dress, have adopted the same customs and have two classes of expatriates, trade and the service of the Beulah; but the former has the preference, and there are very few ulema, or persons employed in the service of the plain. The town is a receptacle for the religious affairs, though they are too proud to pursue them openly. Pursue the exception of a few potteries and dyeing-houses, the people of Mecca have not a single manufacture. During the hajj Mecca becomes one of the largest fairs in the East, and certainly the most interesting, from the variety of nations which frequent it. The merchants of the place make large profits during this time by their merchandise. They have also a considerable trade with the Bedouins, and especially with the inhabitants of the towns of the Nodj, who are in want of India goods, drugs, articles of dress, and corn. The greatest profit however is derived from supplying food for the pilgrims. The consumption of grain is much greater in Arabia than in any of the surrounding countries, for the great mass of the population live almost entirely on wheat, barley, lentils, and rice, and use no other article of food except a little of butter. The wholesale merchants are very rich, and have establishments at Jidda, whence they receive nearly all their merchandise.

Mecca was, up to recent times, governed by a sheriff, who was raised to his office by the famous family of the Nodj, and the consent of the powerful sherif families of Mecca. He held however his authority from the Turkish Sultan, who invariably confirmed the individual who had got possession of the government. The revenue of Arabian, trade and the demand for grain diminished, and the Nodj was no longer able to send large armies with the hadj caravans, the sherif of Mecca became entirely independent, and disregarded the orders of the Porte. But Mohammed Ali of Egypt has restored the
authority of the Osmanis in the Hadjia, and unwound all the power of the sheriff, allowing to the present sheriff a merely nominal sway. The sheriff is chosen from one of the many tribes of sheriffs, or descendants of the Prophet, who settled in the city; the selection was, of course, made by and reduced to a few families of Mecca. The succession is not hereditary, but although it seldom takes place without some contest, there is little bloodshed in general; and though instances of cruelty have occasionally occurred, the principles of honour and good faith which distinguish the wars of the Desert have generally been observed.

(Burchhardt's Travels in Arabia; Allrey's Travels in Modern Turkey, Tripoli, Cyprus, Egypt, Arabia, Syria, and Turkey.)

MECHANICAL POWERS is the name given to certain simple machines or engines, for these words are applied indifferently, either of which is occasionally used by itself in moving bodies or raising weights, or any of which are combined together in the formation of the complex constructions which are employed in manufactures and the arts. Frequently however, in investigations relating to statical equilibrium, the properties of the mechanical powers are introduced when no machine is contemplated; as when, at some part of a plane surface, the effect of a pressure at another part is determined by the ratio of the distances from a supposed point of support. The several machines to which the name of mechanical powers is applied are the Lever, the Wheel and Axle, the Inclined Plane, the Wedge, the Screw, and the Pulley. Each of these has several forms, which are described under those words in the body of this work, and the last in the Supplement.

The object proposed in every machine is to transmit a force from one point to another; and it is immediately applied to that at which some resistance is to be overcome or some operation to be performed; and, in the transmission, the intensity of the motive power is to be increased so that effects may be produced which could not be accomplished by that power alone. The increase of the power is obtained by causing part of the resistance which is to be overcome to rest on the machine or on an object by the aid of the machine, which is used for its support, but such part which remains is opposed to the motive force. Thus, if it be required to raise a heavy body to a certain height from the ground, no exertion of human or animal strength may be sufficient, if directly applied, to accomplish the end; but if a plane inclined to the horizon and extending from the object to the spot to which the latter is to be raised be formed, and the object can be placed on its foot, the force of gravity in the vertical direction being resolved into two forces, one of which is destroyed by the reaction of the plane, the other may be overcome by a motive power less in intensity than that which would be required if a direct application of force were made; in other words, the distance over which the expenditure of the end diminishes in proportion as the length of the plane is greater.

The manner of overcoming a resistance, which is specified in the preceding, is a mechanical contrivance, and it is evident that in every application of a mechanical contrivance to overcome a resistance, as much advantage is lost in respect of time or space as is gained in respect of power. For it is evident that, in order to raise the object vertically through a space equal to the height of the plane, it would be necessary to move it over a space equal to the length of the plane; that is, through a space which bears the same ratio to the vertical height as the weight of the object bears to the power required to move it up the plane.

An account of the applications of the mechanical powers in the construction of complex machines would involve descriptions of many objects, some abridged and dispensed with; and therefore the reader is referred to works in which machines or engines are expressly described, as Gregory's 'Mechanics,' vol. ii., and Barlow's 'Practical Mechanics,' in the 'Encyclopaedia Metropolitana.'

In determining the efficacy of the mechanical powers it is evidently necessary to consider their parts as mathematical lines, and to treat all of them connected together without rigidity, so that a perfect equilibrium may subsist in the machine itself before the moving power is applied. The most simple lever, for example, of a physical kind, is a rod or plane, which is acted on by two forces of equal magnitude in the fulcrum, are of unequal weights; and, in order to reduce such a lever to a state from which the exact relation between the opposing powers may be found, the weight of each arm must be computed, and being, in imagination, applied at the centre of gravity of the arm, the product of the weight multiplied by the distance of the centre of gravity from the fulcrum is to be added to the moment of the weight against the fulcrum, and hence the moment of the two forces which would be equivalent to them, at any given instant, the principles of honour and good faith which distinguish the wars of the Desert have generally been observed.

(MECKENEN, MECKENEN, or MECHELN, ISRAEL VAN, a celebrated Dutch goldsmith, born in the fifteenth century, born probably at Meckenen near Bocholt, in the bishopric of Münster, though this is a matter of speculation, and his name is written in a great variety of ways, but the above form has met with most supporters, as it is found written in full on his tombstone and upon two of his prints: some however have supposed that the engraver and painter were two distinct artists, or that Israel van Meckenen is not Meister Israel the painter mentioned by several old writers. There are eighteen beautiful old oil-paintings in the Pina-kohak at Munich, and some in other collections, which are attributed to Meister Israel; they are of the Van Eyck period, and most of them have been found in the neighbourhood of Cologne and Cleebuzen, which is one of the reasons for concluding that Meckenen in Westphalia was the artist's birthplace, notwithstanding Meckenen near Born is in the very district in which these paintings have been found. There is very good evidence in favour of Meckenen, as Israel was buried at Bocholt, and he appears to have resided there. In Ottley's 'Early History of Engraving' there is a print from a drawing in the guild house at Cleebuzen of Israel van Meckenen's tombstone (since lost), which contains an inscription in the old Gothic character to the following purport.—'In the year of our Lord 1506, died Master Israel van Meckenen; his soul rest in peace. In 1507, a year and a half after his death, an engraver was born, whose name is v. M.: v: en: ijij: up: sinte: meritijnas: avend: staat de: erber: meister: Israel: v: Mecken: a: siete: roste: in: vraste.' Israel Van Meckenen was evidently an engraver, from the signatures on his numerous prints, and we know him to have been a goldsmith, from accounts in the old Bocholt records in which his name occurs, from 1482 to 1486 inclusive; but he is on no occasion mentioned as a painter. Yet a painter of the name of Israel is mentioned by several writers, and among them by Jacob W Answer...
Ishmael alone. He has engraved his own portrait twice: in one, his name is signed in full ‘Ishavel van Meckenen, goldsmith;’ the other, in which his wife is also engraved, is marked ‘Francesca of Isavel d’Ido.’—I. V. M.

The pictures attributed to Ishavel van Mecken, upon what authority is not explained, are all upon gold grounds and upon panel. They are some of them on a large scale, many of the figures being 36 inches high. The size of life, in an execution so easy to equal any works of their style extant; their expression is often excellent, and the colouring very clear, forcible, and effective. The Ascension and Coronation of the Virgin, Josiah and Caleb at the golden gate, and several pictures of Apostles, in the Pinacothek at Munich, are very beautiful works, and if by Vanc Mecken enhances, he is evidently entitled to rank with the Van Eycks, Wilhelm von Köln, Hans Burgkma, the younger, Lucas van Leyden, and other distinguished masters of that time and school. Some of these pictures were drawn in lithography, in 1822, by N. Strixner. The supposed signature of Van Mecken, with date, on a picture in the gallery of Vienna, mentioned in the catalogue of von Mechel, is according to Bartisch an error.

(Heineken, Neue Nachrichten von Künstler und Kunstfreunden; Florio, Geschichte der Zeichnenden Künste; etc.; Bartisch, Pastror-Gemälde; Becker, Künstlerblatt, 1859; Nagler, Neues Allgemeines Künstler-Lexicon; Dillig, Gemäde in der Königlichen Pinakothek zu München; Brillot, Dictionnaire des Monuments, etc.)

Medicus, an apricot, a poppy, and cory, a resemblance, a genus of plants belonging to the natural order Papaveraceae, and formerly referred to Papaver. This genus stands between Papaver and Argemone. It has 4 petals, numerous stamens, a short style, and free stigmas; the capsule obvate, opening by pores beneath the apex.

There is but one species, M. Cambrica, the Welsh Poppy, and this is native of Great Britain, but it is a rare plant. It is also found in many parts of Europe. It has yellow flowers which are very fragrant, and are seated on long peduncles which are reflected before the opening of the flower, so that the flower-bud is drooping. It is an ornamental plant, and may be grown in the garden. It grows in a rich, light soil, in a shady situation. It may be propagated by dividing the roots, or by seeds.

MEDICAGO (from μέθαλος, the Greek name of one of the species), a genus of plants belonging to the natural order Leguminoseae, to the tribe Loteae, and the subtribe Trifoliolae. It has the calyx somewhat cylindrical 5-clawed, the keel rather removed from the vexillum; the stamina dimorphous; the legume many-seeded, of various forms, reniform, falcate, or coleolate, but usually twisted in a spiral manner. The species are herbs or shrubs, with the stipules usually cut; the leaves trifoliolate, the leaflets usually toothed, and the peduncles 1-2-branched.

M. sativa, Lucern, has many-flowered racemes; the pods contain 3 seeds; the flower is white in three, tawny, downy; the flower 3 armed; the pod-capsule shorter than the calyx and the stem; the leaves obvate-oblong, dentate above, marginated. This plant is a native of Europe, and is found wild in England and Scotland. It has an erect stem, with yellow or violet flowers. It is commonly cultivated in the fields of Europe (Lucassen, P. C.), and Babington says that ‘the wild specimens found are scarcely naturalized.’ This is the index of Theophrastus, ‘Plant, de Caus.’ lib. 2, cap. 20; and the Medicota of Flinay, lib. 18, cap. 10.

M. falcatoides has the racemes many-flowered, the pods compressed, sickle-shaped, downy, unarmed; the pedicels shorter than the bracteoles; the leaflets oblong, dentate above, marginated, mucronate. It is a native of Europe on dry mountainous pastures. In England it is a rare plant, but it is occasionally found on dry gravelly banks and old stone walls. It is said to be the Lucern which is cultivated in Switzerland.

M. leucophylla, Black Medick, or Black Nonsuch, has many-flowered denser oval spikes; the pods compressed, kidney-shaped, furrowed and pointed, and with prominent veins; the stipules obliquely ovate, slightly toothed; the leaflets roundish-obovate, dentate above, marginated, mucronate. It has a procumbent stem with yellow flowers, and grows in pastures, in hedgerows, and on waste grounds, and is plentiful in Great Britain. It affords excellent fodder for sheep, and must be treated in the same way as lucern.

M. arbores, Tree Medick, is a villous straberry plant; it has ovate-corolldated leaflets nearly entire; the stipules linear, acute, entire; the peduncles racemose; the legumes stipitate, twisted, reticulated from transverse veins; 2-3-seeded, the seeds roundish-ovate, 2-3-branched, of the size of those of the south of Europe, and appears to be the sertura of Theophrastus, ‘Hist. Plant.’ lib. 4, cap. 5; lib. 1, cap. 9; ‘De Caus. Plant.,’ lib. 6, cap. 6; and the sertura of Dioscorides, lib. 4, cap. 28; of Flinay, lib. 13, cap. 24; Virgil, ‘Ecl.’ 1. 79; ‘Georg.’ ii. 431.

Besides the first species, described above, M. maculata, M. minima, and M. denticulata are natives of Great Britain, and occur in several places. They are not very common in the British Flora as growing on the sea-shore at Orford in Suffolk; Mr. Babington, in his Manual, states that he is convinced, from personal observation, that no such plant now exists in this country.

In cultivation the species may be easily raised from seed, and the shrubby species propagated by cuttings. The perennial herbaceous species may be propagated by dividing their roots.

(Babington, Manual Brit. Bot.; Fuss, Synopsis Plantarum Florae Classicum.)

MEDICI, GIAN GIACOMO, Marquis of Mariangino, born at Milan in 1495, was the son of a steward of the Duke of Milan. He entered early the military profession, in which he showed great courage, accompanied with a want of all principle. In the war between the Italian Powers and the Empire, for the disposal of Lombardy, Medici took the part of his countrymen, and served under Pescara in the campaign of 1522, in which the French were driven out of Lombardy. He acquired the confidence of the Emperor Charles V., who employed him to murder Astorre Visconti, a descendant of the former dynasty of the dukes of Milan, who gave umbrage to the actual occupant of the ducal throne. Medici, having committed the deed, was sent to assist in receiving the castle of Musso, situated in the mountains above the lake of Como, which was still held by the French. He succeeded in taking possession of it, and he kept it for himself for years; he often, for the Emperor, drove the garrisons out of Italian territory, and making predatory incursions among his neighbours. When Francis I. again invaded Lombardy, in 1525, Medici made an incursion into the Valtellina which belonged to the Grisons, and took possession of Chiavenna. The Grisons, alarmed for their own country, recalled their troops which were serving as auxiliaries in the French camp, and this defection is said to have contributed to the defeat of King Francis at Pavia. In consequence of this service, Medici was acknowledged by the duke as feudalatories of Musso and other places, with the title of Chatelain.

In the subsequent quarrel between Duke Sforza and his overbearing brother, Medici put himself at the head of the disaffected Milanese emigrants, and annoyed the Spaniards, but after a time, the Spanish governor of Milan, Don Antonio Caracciolo, retrieved his former confidence. Medici was then raised to the title of Marchese of Musso. The object of Medici was to carve out a principality for himself at the expense of his neighbours. He again invaded the Valtellina and took Morbegno. At last, in the year 1532, Duke Sforza, partly by force, and partly by offering him a sum of money with an annuity, the past, made him give up Musso and his other strongholds. Medici then retired to Piedmont and entered the service of the Duke of Savoy. Here his career as an adventurer terminated. Medici afterwards served in the campaign of 1536 against the French in Piedmont. Having returned to Milan after the death of Duke Sforza, he was made Marquis of Marignano, by the Emperor Charles V., and in 1539, when he accompanied Charles in his expedition against the revolting Flemings, from thence he went to Hungary to fight for the emperor against the Turks, and afterwards he served in Germany under Charles himself against the Duke of Saxony. Returning to Italy, Medici was appointed to the command of the expedition against Siena, which city he took after a long siege in the year 1545. On his return he was received with the highest honours, and eventually he was created Duke of Musso, with great honour, and on this occasion his relationship to the Medici of Tuscany was acknowledged by Cosmo, notwithstanding which it is still greatly doubted, or rather disbelieved. He married to his second wife, in 1540, Pia, daughter to Giovanni Angelo Medici having become pope, in 1565,
by the name of Pius IV., built him a splendid monument in the
cathedral of Milan, whither his remains were transferred.
Of the monarchs of that line who succeded him none rose to
commanders of the age of Charles V., but was likewise one of
the most unprincipled, rapacious, and cruel.
(Misgina, Vita di S. Jacopo Medici, Marchese di Marigna-
poli, 1660.)
MEDINA, the second holy city of the Mohammedans,
and the place where their Prophet was buried, is situated in that
province called Mekka or Hejaz, or Hej, about 25° 15' N. lat.
and 35° 40' E. longitude, being thirteen miles from the
town of Yembo on the Red Sea, which is the harbour of
Medina.
Medina is built on the elevated plain of Arabia, not far
from the eastern base of the ridge of mountains which divide
the table-land from the lower country between it and the
Red Sea. The town stands on the lowest part of the plain,
in which the watercourses unite, which produce in the rainy
season numerous pools of stagnant water, and render the
climate unhealthy. Gardens and date-plantations, inter-
spersed with fields, enclose the town on three sides; on the
side towards Mecca the rocky nature of the soil renders cul-
tivation impossible.
The city forms an oval about 2800 paces in circuit, ending
in a point. The castle is built at the point on a small rocky
crane, and is enclosed by a wall of about three and a half
hundred yards long. The interior walls are whitewashed all around, except the southern
one and part of the south-eastern corner, which is casued with
slabs of marble, nearly up to the top. The floor under the
principal colonnades on the western side of the town,
which is to the north, has a coarse pavement and is nearly covered with sand,
as is likewise the open square. On the southern side the
whole is paved with fine marble across the whole colonnade,
and in those parts nearest the tomb of Mohammed this pave-
ment is of mosaic, of excellent workmanship. Large lofty
windows, with glass panes, admit the light through the
south wall; some of them are very well painted. On the
other sides there are smaller windows along the walls, but they
are neglected.
Near the south-eastern corner of the mosque stands the
famous tomb, detached from the walls so as to leave between it
and the southern wall a space of about twenty-five feet, and
fifteen between it and the eastern wall. The enclosure which
procts the tomb from visitors, forms an irregular square of
about twenty paces, in the midst of the colonnade, several of its
pillars being included within it; it is an iron railing painted
green, about two-thirds of the height of the columns. The
railing is of good workmanship in imitation of filigree, and
is decorated with open-worked inscriptions in yellow bronze.
It is of so close a texture that no view can be gained into the
interior except by several small windows, about six inches
square, which are placed in the four sides of the railing, about
five feet above the ground. On the southern side, which con-
forms to the sides of the mosque, there is an opening, divided
from the rest by a railing, so that one can stand when praying, the railing is thinly plaited over with silver,
and the inscription 'There is No God but God, the evident
truth," is repeated in silver letters across the railing.
This enclosure contains four large porticoes, each with four
gates, three of which are constantly kept shut, and one only
is opened every morning and evening to admit the eunuchs,
bring the body to the chamber at the foot of the dome

The enclosure is called El Hejira. Permission to enter it is
granted gratis to people of rank, and may be purchased by
other people, from the principal eunuchs, for about twelve
or thirteen dollars; but on entering the enclosure nothing more is
to be seen than what may be observed when peeping at the
windows of the railing. At the distance of only a few paces
from the railing is a curtain carried all round; it is equal in
height to the railing. It is made of a rich stuff of various
colours, interwoven with silver flowers and arabesques,
with a band of inscriptions in golden characters running across
the middle of it. This curtain is a small opening at the northern
end, which is always closed, and no one is permitted to enter within its holy precincts, except the chief
eunuchs, who take care of it, and who put on during the
night the new curtain sent from Constantinople, whenever it
is wanted, or take it off in the morning to let in the light
from the throne. The old curtains are sent to Constantinople, and serve
to cover the tombs of the sultans and princes.
According to the historians of Medina the curtain covers a square building of
white marble, the interior of which are the tombs of Mohammed and his two
earliest friends and successors, Abu Bekar and Omar. These
scrobes are deep holes, in which the coiffs are deposed; that of
Mohammed is cased in silver. The floor between the
curtain and the railings is laid with variously coloured
marbles in mosaic; glass lamps are suspended all round the
curtain, which is lighted every evening and all night.
The whole of the enclosure is covered with a fine
lofty dome rising far above the domes which form the roof
of the colonnades, and is visible at a great distance from the
town and out of sight of the colonnades. As soon as the clergy to Medina catch sight of it they repeat
some prayers.

Near the curtain, and within the railings, is the tomb of
Seita Fatima, the daughter of Mohammed and wife of Ali;
it is a lighted cupola formed and covered with a
richly embroidered black brocade, and without any other ornament.

Mohammedian tradition says, that when the last trumpet
shall sound Aya (Jesus Christ) is to descend from heaven
to earth, and to announce to the inhabitants the great day of
decision; after which he is to die, and will be buried in this
Hegira by the side of Mohammed; that when the dead shall
rise from their graves, they will both rise together and ascend
to heaven, where Aya will be ordered by the Almighty
to separate the faithful from the infidels. In conformity with
this tradition the spot is pointed out through the curtain of the
Hegira where the tomb of Aya will be.

Four gates lead to the interior of the mosque; a few steps
are to be ascended from the neighbouring streets up to the
gates, which are made to look smaller than they really are,
contrary to what is the case Mecca. About three
hours after sunset the gates are closed by means of
folding doors covered with iron, and not opened till about an
hour before sunrise. This is the custom of the place, as the
mosque can easily obtain permission from the mufti on
guard, who sleeps near the Hegira. During Ramadhan
the mosque is kept open the whole night.

The inhabitants of Medina, like those of Mecca, are not
Bedouins, but strangers, who have come to the place as pil-
griims and afterwards settled there, or they are descendants of
such strangers. Medina is not so great a place of commerce
as Mecca, and the merchandise are not so rich, but it has the
advantage of having a considerable tract around which is fit
for cultivation, and there are many wealthy landowners in the
town, who let out their possessions to poor people. Wheat
and barley are cultivated, but the chief profit arises from the
plantations of date-trees, the fruit of which is held in greater
estimation than the dates of Egypt.

(Burchhardt, Travels in Arabia.)

MEDITATIO FUGAE WARRANT, in the law of
Scotland, is a writ by which a debtor, supposed to be about
to make his escape from the country, is arrested and kept in
custody, until he pay the debt, or find security to pay it if he
shall not in due time repay it. It deserves no notice from its
being an old consuetudinary practice in Scotland,
which happens to be in union with the late legislation of
England on the subject of debtor and creditor. In Scotland
there is no statute of arrest on the debt; but the law of
England anterior to the 1 & 2 Vict. c. 110, appears to have
been ever acknowledged; and it was only on the
ground that he was about to flee the realm, that a debtor
could be arrested, unless on the authority of a final judgement
of a court of law, or on the extracted registration of one of those
documents in which by a 'cause of registration for execution'
or by commercial custom (as in the case of bills of exchange)
the grantee agrees to put in the position of having a decree
recorded against him. A meditatio fugae warrant may be
granted by any judge having jurisdiction in questions of debtor
and creditor, at the instance of the sheriff, a magistrate of a burgh, a justice
of the peace. When granted by a sheriff, it has, by a
late act, the advantage that it may be executed in any part of
Scotland, whether without or within the jurisdiction of the
sheriff who grants it. (1 & 2 Vict. c. 110, s. 25.)
The grantee of such a warrant is to be kept in the
place, the oath of the creditor, who must distinctly set forth the
amount, nature, and origin of the debt. The debtor is
then brought before the judge, who, hearing the statement of
both parties, must insist on a confession of debt, and if the
magistrate on a distinct oath of debt should refuse to commit,
he is personally liable to the creditor for the consequences,
and the execution of the writ. But, if the debtor, he grants a
warrant on an improbale or incoherent statement, he will be liable in damages
in the person committed. At all events a person desiring a
meditatio fugae warrant is liable to damages if he obtain it on
a false statement. A person imprisoned on such a warrant must
be liberated in six months, unless his further imprisonment
be authorized by other judicial proceedings. By 6 & 6 Wm.
IV. c. 70, imprisonment for any debt under 8l. 6s. 8d. (100l.
Scots) was abolished in Scotland, and it was lately found by
the court of session that meditatio fugae warrants come within the
act.

MEGALICHTHYES, a genus of fossil Ganoid fishes, from the
carboniferous strata of Edinburgh, Glasgow, Leedes, Man-
chester, and Lancaster. (Agassiz, Recherches sur les Pisciens
Fossiles.)

MEGACODON, a genus of fossil Conichthyes, proposed by
Goldfuss, and the Deventer and Dufton. (Goldfuss, Phaen.
MEGAPHYTON, a genus of fossil plants, from the coal-
measurens. (Artis, Antediluvian Physiology.)

MELALEUCA (from Melaleuca, black, and leuca, white), a
genus of plants belonging to the name Myrtaceae. They
have the calyx-tube nearly hemispherical, the limb 5-partite;
the petals 5; the stamens numerous, combined into 5 elong-
bundled, tarsi alternate with the petals; the anthers in-
compact; the style siliquiform, the stigma obtuse; the capsule
conato and enclosed in the thickened tube of the calyx,
which is sessile on, and adnate at its base, to the flower-bearing
branch, 5-seelled, many-seeded; the seeds angular. The
species are trees or shrubs with alternate or opposite ever-
leaves, equal at the base, with flowers perfectly sessile, or
somewhat interpreted with the branch, arranged in spikes or
heads, and of a white, yellowish, or purplish colour.

(M. Glechoma.) Glechoma has the leaves alternate, eliptic-lanceolate, acutish, rather falcatate, 5-
served; the flowers rather distant in spikes, the rachis and
calyces villous. This is the species which yields the chief
oils of Australia, and is fixed under the name of Capej
oil. It is a native of Ambonya and other East India islands.

[Mealaucua Cazepetti. P. C.]

M. Leucodendron, White-tree, or Capej-tree, has alternate
long lanceolate acuminate falgate 5-served leaves; the
flower-bearing branches pendulous; the flowers in spikes
rather distant, which, as well as the rachis, are quite glabrous.
It is a native of the East India Islands, and was at one time
supposed to yield the chief Capej oil. It is a native of
South Africa, and is a shrub that possesses little or no fragrance in its leaves, and that
it is seldom or never used for the distillation of the oil which is
used in the European markets.

Upwards of thirty species of Melaleuca have been described,
the majority of which are natives of New Holland. Many
of them are fine plants with beautiful blossoms, and very
desirable for the conservatory or greenhouse. They grow well
in a mixture of peat, loam, and sand. The leaves are
ragged by cuttings, which will readily take root if planted in a pot of
sand and placed under a hand or bell glass.

(Lindley, Flora Medicus; Don, Gardener's Dictionary.)

MELOSTOMA is a genus of plants belonging to the natural order Scrophulariaceae
or Scrophulariaceae. It has a tubular 4-toothed calyx; a
ringent corolla; the upper lip compressed laterally with reflexed mar-
gin; the lower lip broad; the styles with obclavate appendages;
liquidly acuminate, compressed; one or two seeds in each
carapace. The smooth. It is an annual plant, with opposite lanceolate
linear entire leaves, with opposite usually secondarily
flowers. Eight species are enumerated by Don, six of which
are European and two Americas. Of the six European
four are natives of Great Britain.

M. cristatum, Crested Cow-wheat, has the spikes densely
imbricated, 4-sided, and the bracts heart-shaped. It is a na-
tive of woods and thickets in the eastern counties of
England, and generally also of the north and middle of Europe.
M. arvensis, Purple Cow-wheat, has lax conical spikes,
and ovoid lanceolate atttached leaves. The bracts are of a purpl.
rose-colour; the flowers yellow, variegated with rose-colour
and purple. It is a native in fields of wheat in the south
of Europe, and is found in Great Britain, though only rarely, in
Norfolk and the Isle of Wight.

M. pratense has the flowers axillary, secund in distant
pairs; the calyx closed; the upper lip protruded. It has
large pale yellow flowers. It is a native of Great Britain,
but has not yet been found in a common situation. It is
defined as a species of Scrophularia, with an open calyx,
and lips equal in length. It is a rare plant, and is found in
alpine woods.

(Elbington, Manual of British Botany; Don, Gardener's
dictionary.)

MELASTOMA (from Melanesia, black, and stoma, a
mouth, because the berries when eaten stain the mouth black),
a genus of plants, the type of the natural order Melastomataceae.
It is the tube of the calyx ovate, half-shedding to the ovary, densely covered with scales or bristles; the limb 5-regularly 6-angled, the segments alternating with the appendages, both characters of these species belonging to the petals; the anthers oblong linear, a little arching, opening by a pore at the apex, each furnished with a stiple-formed connective, which is in some species elongated, and in others a little spatulate; the lobes of the limb part of the ovary conical and bristly; the style filiform, somewhat thickened at the apex; the stigma a pruinose dot; the capsule baccate, 6-seeded, opening irregularly; the seeds coarsely spinose. The leaves of this genus are shrubs, which are usually covered with strighe. The leaves are petiolate, and either quite entire or serrulated. The flowers are large, white, rose-coloured, or purple.

Melanotaenia Malabar Melastoma is a shrubby plant with tetragonal branches rough from strighe; the leaves elliptic-oblong, obtuse at the base, acute at the apex, quite entire, green on both surfaces, and scabrous from strighe; the corollas 1-5-flowered; the calyx clothed with asprege strigose scales, with ovate acute lobes, the connectives of the anthers short, or very long. It is the native of the East Indies, and frequent in the Indian Archipelago. The leaves of this plant are employed by the natives, where it grows, as a remedy in diarrhoea, dysentery, and mucous discharges.

Between thirty and forty species of Melastoma have been described. They grow in the warmer districts of the Old and New Worlds. They are found in Asia, in this, and in Africa. Their flowers are very handsome, and all the species may be cultivated for ornament. They grow well in a mixture of loam, peat, and sand, and young cuttings root freely in sand in a sunny place.

(Lindley, *Vegetable Kingdom*; Don, *Gardener's Dictionary*.

MELIC, a genus of plants belonging to the family of Gesneriaceae. It has nearly equal glumes, with lateral ribs, nearly as long as the ovate spikelet of 1 oder 2 flowers rounded on the back, and a club-like rudiment of one or two more; the paleae hardening on the loose fruit; the styles terminal. There are two British species of this genus, *M. uniforma* and *M. maculata*, which are found in damp shady woods.

(Babington, *Manual of British Botany*.

MELLOTUS (from *Medusa*, 'honey', and *larios*, 'lotus'), a genus of plants belonging to the natural order Leguminosae. It has a calyx with five nearly equal teeth, the keel obtuse, the filament filiform, the ovary straight, the pod subglobose or oblong, 1-seeded, 1-seeded, longer than the calyx, the petals distinct, deciduous. The species are herbaceous plants with stipules adnate to the petiole, and trifoliate leaves with usually toothed leaflets. None of them are ornamental plants, but they are valuable for the seed and the cuttings. The flowers of the species are used as fodder for animals.

(Melilot, P. C.) Two species are found native in Great Britain. *M. officinalis*, the common Melilot, has lax racemes, with white to cream-colored flowers; it is a hardy, persistent, and standard equal; the pods ovate, acute, compressed, transversely wrinkled, hairy; the seedlets serrate, truncate, narrow ovate; the stipules setaceous, entire. *M. vulgaris* has the wings and keel equal, but shorter than the standard; the pods ovate, obtuse, mucronate, reticulate, rough, and glabrous. It is a rare plant, and is found in sandy and gravelly places near the sea.

(M. Mesembria). Mesenia Melilot, an erect stem, with ovate-cuneated denticulate leaflets; the stipules broad at the base, toothed, linear at the apex; the racemes few-flowered; the calyx nearly equal, nearly hardy, slenderly -broad at the base, the lanceolate, acute, very much -nerved, 1-seeded; the seed ovate, compressed, large, black, rugged from dots. This plant is a native of Barbary, Sicily, Piedmont, and the Straits of Messina. It is the Melilotus of Thunberg, and is the *L. Maculata* of Dioscorides, lib. iv., cap. 171. It is also the Lotus of the Romans (Pliny, xiii. 17; xxxii. 21; Virgil, *Aeneid*, i. 184, and iii. 934). None of the species of this genus are worth cultivating as ornamental plants. They may be easily propagated by seeds, which should be sown in the open border in spring. A light airy soil, and plenty of water, is requisite for their growth. They are hardy plants, and may be raised from seeds.

(Fras, Synopsis; *Manual of British Botany*; Don, *Gardener's Dictionary*.

MELISSA (from *Melissa*, a bee), a genus of plants belonging to the Labiate or Lamiaceae. This genus has been variously defined according to the different views of systematic botanists. Bentham, in his monograph on the Labiate, has referred about 30 species to this genus. They are all known by the common name of Balms, and some of them are described by Calamintha, P. C. S. The genus thus extended has the following characters:—The calyx is tubular, 13-nerved, usually striated, bilabiate; the upper lip generally spreading tridentate; the lower lip bifid; the tube of the corolla straight or incurved ascending, naked inside, usually exerted, the throat generally inflated, the limb bilabiata, the upper lip erect, flat, entire, or emarginate; the lower lip two to three times as long as the middle lobe usually the broadest, entire or emarginate; the stems 4, didynamous, ascending, approximate by pairs at apex, or rarely a little distant, lower two the longest, the superior two sometimes sterile, the filaments too short, 2-celled, the connective often thickened, the cells distinct, parallel, diverging; the lobes of style sometimes equal, subulate with minute terminal stigmatic; sometimes the lower lobe is elongated, recurved, flattened, with stigmatic margins; the achenia dry and smooth. The species are usually herbs, sometimes under-shrubs, with a variable inflorescence.

The only species of the old genus Melissa admitted into the British Flora is *M. officinalis*, common Balm. It has ovate crenato-serrate acute leaves, pale beneath, the calyx subcampanulate, slightly ventricose in front, distinctly 2-lipped, the upper lip flat truncate, with three short broad teeth, the lower with two, six-toothed, flat. It is a native plant, although it has a place in the British Flora, is a doubtful native. In its recent state it has a rough aromatic taste and a pleasant lemon-like smell. It is frequently used in infusion, under the name of Balm, and in ointments, as a cordial and restorative. It was one of the medicines recommended by Paracelsus, but at the present day it is only used as a popular remedy.


MELLIAN, CLAUDE, a French painter and distinguisher engraver, was born at Abbreville, in 1601. He studied in Rome under the then celebrated Vouet, but he soon gave up painting for engraving, which from that time became his chief business. He remained some years in Rome, and engraved many plates there, executed in the ordinary method of line-engravers. He did not altogether adopt his own peculiar method of engraving by a single line, until his return to France. He latterly executed all his plates by single lines, that is, instead of crossing one set of lines by a second or even a third act, when great depth was required, he completed a similar effect by merely thickening the single set of lines, the varieties of light and shade he produced wholly by varying the thickness of the line. Melian carried this peculiarity to a great extreme here by the use of the spirals, or curves, which he used in his engravings. Although this has given the engraver a facility, it has lost in effect as a work of art: he made two preparatory drawings for this print; one is in the Royal Library at Paris.

Mellian's prints are very numerous: they amount, according to some accounts, to upwards of 500; many of them are after his own designs. His masterpieces are Rebecca at the Well, after Titienette; St. Peter Nolasco borne by two Angels, after a design by himself; and Pope Urban VIII., after Bernini. He enjoyed a great reputation during his lifetime; Charles II. invited him to England, and Louis XIV. granted him an annual pension, and gave him apartments in the Louvre. He died at Paris, in 1664, and was buried in the church of St. Marcouf in the Faubourg St. Antoine, Paris, on the 15th of August, 1664.

(Forent Le Comte, *Cabinet des Singularites, etc.*; Huber, *Manual des Amateurs, etc.*.

MELIOE. The Linnean genus Melioe included the several genera of heterophyllous Coleoptera now forming the family Cantharidae, interesting on account of its including those beetles known under the name of 'blistering flies,' and employed in medicine. The term melanoxylon Lam. refers to the aperous Cantharides, and the species are all beetles with large and swollen bodies, and short ovate elytra, lapping over each other at the base of the suture. They are sluggish insects, feeding on various plants, especially those of ranunculus. When alarmed they emit from the articulations of their legs an oily, yellow, or reddish liquid. Latreille maintained that this insect was the *buprestis of the ancients*; to which various species of Meliloba and related genera were transferred. A paper on the subject in the 12th volume of the *Memoires du...*
The nature of the larva of the melaleuca has been a subject of considerable discussion among entomologists, having been supposed to be a minute, active, parasitic insect living on the trunks of trees. Most entomologists, however, have held this view since the time of Linnaeus, but the observations of Geoffroy, Newport, and Westwood, go far to prove that it is a mistake, and that there is no animal in the case.

MELVILLE ISLAND is situated on the northern coast of Australia, between 11° and 12° S. lat. and 180° and 181° 34' E. lon. It is separated from Bathurst Island, on the coast east of it, by Apley Strait, which is forty-six miles long, and between two and four miles wide. East of the island lies Coburg Peninsula, where a British colony was established some time before 1829. The island is named after Apley, p. 34. Next to it is the eastern end of it, which at the narrowest point is fifteen miles wide. This island is called Dudas Strait. The eastern end of Melville Island is only fifteen miles from the mainland of Australia, and the sea between them was called Clarence Strait by Captain King. It is muddied with small islands, rocks, and reefs, between which run rapid currents. The area of the island may be about 1800 square miles.

The northern line of coast, and also the western, along Apley Strait, are low, intersected by swamps, and covered by impenetrable woods of mangroves. The interior is more elevated, and is a vast plain, extending from the shore about 150 feet above the sea-level, but towards the southern side there are a few small elevations, which probably rise to 200 feet. The island is well clothed with wood, and presents one of the most elevated, picturesque, and fertile districts. The ground is covered with small shining masses of ironstone having a metallic lustre as if they had been ejected from a furnace. The sloping sides are less stony, and the flat ground is generally quite free from stone. Streams of water are scarce, but the swamp water is generally drinkable, and by skimming wells a constant supply of excellent water is obtained. The swamps are generally full of long grass and reeds, intermixed with small trees. Narrow gullies cut up with a kind of cane or reed (Flagellaria indica, Linn.) lead into these swamps.

The soil of the island is of inferior quality, partaking of the character of the ironstone which is generally spread over it. The soil is stony, and that is to a greater extent than is commonly supposed. The close to the shore the country is very rocky, and the soil is light and sandy, intermixed with sand and gravel. Bordering on the swamps it is richer and more productive, and it is supposed that some of the flat soil situated are capable of producing rice. The vegetation is very luxuriant, and during the whole year there is plenty of grass for cattle. The timber is in general of good quality, and although trees which are small in the stem predominate, there are many of considerable dimensions, and are useful for building fences, hut building, fencing, and to agricultural purposes. The average number of trees to an acre is about one hundred and twenty, but in some places they amount to one hundred and eighty. Among these forest-trees several species of eucalyptus are most abundant. The cabbage-tree is common. Ginger grows wild.

The most common quadrupeds are kangaroos, opossums, bandicoots, native dogs, a small brown rat, and a species of squirrel. The Termite bat or flying fox is very numerous. The birds are mostly distinguished by their beautiful plumage, especially some species of cockatoos and parrots. There are also several varieties of king-fisher, among them the gigantic king-fisher (Dacelo gigas), swamp pheasants, quails, currawongs, wild ducks, sand larks, wild geese, several kinds of cranes, and a wild fowl of the gallinaceous order of considerable size. Many beautiful small birds are very abundant. The length of many of them is about twelve in length; some of them are venomous. There is also a great variety of lizards of beautiful colours: the largest are the frilled iguanas (Chlamydosaurus Kingii), and the common iguanas (Iguana delicatissima). A large snake found in Apley Strait, and turtles are found at some places on the coast. The most destructive of the numerous insects are the weevils.

The number of natives is rather large, considering that they lead a wandering life, and during the dry season live on kangaroos, opossums, bandicoots, iguanas, and lizards; and during the wet season live on fish, turtles, crabs, and other shellfish; and live mostly on a tree called the sago-palm. They are evidently of the same stock as the natives of Australia, but they are more athletic, active, and enterprising. Their language is said to be so far different, that a native of New South Wales could not understand the word of what they said. In the construction of their canoes, spears, and waddies, they show much ingenuity, although the workmanship is rough from want of tools. Their canoes, water-buckets, and other receptacles are made of bark or wood, with strips of split cane. They are extremely deficient of strangers, and it was found impossible to enter into any friendly intercourse with them during the four years that the British settlement has been on the island, which is about 45 miles from the colony, and it was ascertained that the soil was far from being fertile, and the climate very debilitating to Europeans, although not decidedly unhealthy. These combined circumstances led to the abandonment of the settlement in 1828, but in 1837 a new one was established in Port Essington on Coburg Peninsula, a place which is visited by the inhabitants of Macassar and other islands, to fish for trepang.

MEMLING, Hans, or JAN, until recently more commonly called Memling, and sometimes Memmleinck, was born at Bruges, about 1445. The initial letter of the name on his pictures is the very same letter as the initial of Maria on a coin of Mary of Burgundy, and in many other names commencing with M, documents of the period. It is the capital M of that time, though modified from M, as in our H with an additional short stroke in the middle, reaching from the under side of the cross line to the bottom of the letter; or somewhat like a small Roman m, the two outside strokes being doubled. On the other hand, his peculiar letter however occurs in two instances as an H also; the question is therefore not absolutely decided. Because a Hans Memling or Memling is mentioned in a German MS., it does not follow that the person with that name is the same as our Hanemling. It is not improbable that Memling's residence in Bruges prove that he was a Fleming, as he may have been attracted there by the fame of Van Eyck. He was born at Bruges, and for that reason Wyngaerde notices a German painter of the name of Hans who lived at
Bruges, and he addled very profusely to Memling. Vasaari also apparently alludes to Memling when he speaks of Ause (Anse) of Bruges. The dates of Memling’s pictures range, according to the printed accounts, between 1450 and 1499. The earliest of these pictures is a painting at the town hall of Aragon, wife of Philip of Burgundy; this picture is mentioned in the anonymous Journal published by Morelli in 1800—a Notizia di Operé di Deseo nella prima Meta del Secolo X V (ed. di N. Morelli, 1800). Crema, and Venetia, scritta da un Anonimo di quel Tempo,’ in which the picture is called Maselino or Memlingo. If this date is correct, Memling must have been born before 1449. His earliest work was probably the Adoration of the Magi at the Convent of St. Catherine in Bruges. The date 1499 is found on a small picture in the possession of M. van Erbom at Utrecht; it is also the year in which he finished some paintings for the Carthusian convent of Miraflores near Burgos in Spain, in which he is said to have died not long afterwards: the account is given by Ponc, in his ‘Viaje de España.’ This convent was destroyed by the French in 1812. Memling appears to have lived some years in Spain; he is supposed to be the Jan Flamenco of Flanders who was at Miraflores between 1496 and 1499, and perhaps later. He probably also visited Italy and Germany, and certainly Cologne; and he is said to have served Charles the Bold at Dijon. This early period of Memling’s life is not marked by any particular achievements; his work is neither rich nor variegated, nor picturesque. The story is, that he was at the battles of Granson and Morat, in 1476; and in the beginning of 1477 he was admitted, ill from wounds and destitute, into the Hospital of St. John at Bruges, where he was received on the foundation, none but inhabitants of Bruges or Maldeghem could be admitted. It was during his residence in this hospital that he painted the beautiful pictures which still adorn that hospital. He was named ‘Prophet of the Bruges of the French,’ a title which was given him from his name among the first of the painters of the fifteenth century. The principal work by Memling in this hospital is the history, in minute figures, of St. Ursula and her companions, executed in oil in many compartments, upon a relic case of a gothic design, known as La Chaise de S. Urasule. This chaise, or shrine, has been made the subject of a special work by Baron van Eeghen, and inserted into the British Museum, ‘d’apres le Legende, et les Peintures d’Hemling,’ Ghent, 1818. The paintings have been drawn in lithography by M.M. Manche and Ghemard. Memling painted also during his stay in this hospital the splendid large altarpiece of the Marriage of St. Catherine; both of which are still there. The Marriage of St. Catherine, in which the figures are much larger than is usual in the case of Memling’s works, was painted in 1479, and is one of the most brilliant pictures of the fifteenth century. It is in three compartments, a centre and two revolving wings. In the centre is the marriage of St. Catherine, and in the background are painted episodes illustrating the lives and martyrdoms of the attendant saints and of St. Catherine herself. The left wing is the beheading of John the Baptist; the right represents the marriage of the Barberesses of Kastoria in Thessaly. The painting of Patmos: the last is a remarkably comprehensive composition. On the exterior of the left wing are two Hospital Brothers, the Apostle James, and St. Anthony of Padua; on the right exterior are two of the Hospital Sisters, with saints Agnes and Clara. There is an inscription on this work, but as it has been renewed, it cannot be taken as an authority in a difference respecting the signification of letters: it is however variously treated. There are three other pictures by Memling in this hospital—a Descent from the Cross, upon wood, with two wings; the Madonna and Child, with a portrait of Martin van Nieuwenhoven, burgomaster of Bruges. In 1499, on the north side of this picture, is a name inscribed in 1487; and a female, inscribed ‘Sibylla Samthena quæ et Persa per anc. ante Christ nat. 2040.’ There are other works by this painter in the Academy of Arts, and in other buildings of Bruges. There is, or was in 1832, a small portrait of a young man in the costume of the hospital brothers of St. John, in the collection of Mr. Aders in London, which is said to be that of Memling himself, but the date on the picture is 1462, fifteen years before Memling is supposed to have entered that hospital, and the history of the picture is not positively known. Passenart has engraved it in his ‘Bouw- en Kunstenaar der Zuiden und Belgen.’ Dr. Waagen does not mention it. Another very interesting work, by Memling, is the collection of Mr. Aders, the travelling altar-piece or altar of the Emperor Charles V., which was preserved in the cathedral of Bur-
undyng name. Few of Memmi's works now remain, and those few are performed degre in 1898; he was the principal men*
the frescoes of the chapter of the chapel degli Spagnuoli at
Florence, painted in 1332; they consist of stories from the
lives of Christ, San Domenico, Santa Peter Martyr, and part
of the Legend of the Donor. The fame of the Donor
was never higher.
In one of the last works are the reputed heads of Petrarch and
Laura, but this story, as Lanzi says, is a mere fable, for
Memmi did not paint Laura until four years after the com-
pletion of these works, as is proved by the inscription
given by Avignon. [GADDI, TADDEO, F. C. S.] There are also
some stories by Memmi, from the life of San Ranieri, in the
Campo Santo a Pisa; they are engraved in Lainosi's 'Il Vittore
del Campo, a Pisa.'
Simone painted also in miniature. There is a MS. of Vir-
gili, with the commentary of Servius, now in the Ambrosian
Library at Milan, but formerly in the possession of Petrarch,
which is preceded by a miniature of Virgil seated with his
pen in his hand, invoking the poetic muse; before him is
Zeus in armour, with his sword, representing the Aeneid;
there is another, a shepherd and a tithe, representing
the burning of the Colosseum; another of Zeus, and Servius is also there,
drawing a fine veil to himself, as symbolical of the elucidation
of his commentary. This design, supposed to have been
made at the instance of Petrarch, is inscribed with the
following couplet:

- "Vestis Virgilii quae tellus carmine fixata,
Susa dedit Simoni digito quae tuta plaxit."

Memmi died in Avignon in 1444; according to the necro-
logy of the Dominicans at Siena, aged sixty, according to
Vasari, but much older according to Della Valle and some other
authorities.

Notwithstanding Vasari's encomium upon the style of
Memmi, which he said was worthy of one of the moderns,
his remaining works are not at all beyond his age, and
he was surpassed by the two Gaddi: his design is meagre and
ugly. Of his portrait of Laura nothing whatever is known. The
reputed head of Laura above mentioned is engraved in
D'Agincourt's 'Histoire de l'Art par les Monuments,' Print.
pl. exzii. 2, and in Cicognara's 'Storia della Scultura,' i.
pl. 48. Cicognara has disputed the authenticity of this and
some other reputed portraits of Petrarch and Laura, at con-
siderable length in the third volume of his History. The
only authentic portrait of Laura extant, of that age, appears
to be a miniature in a MS. in the Bibliotheca Laurentiana at
Florence, which however may have been copied from the
original work by Memmi: there is an outline of this also in
Cicognara's work, i. pl. 42.

Vasari gives the following as the inscription on Simone's
tomb, but he does not say where: — Simoni Memmiu pic-
torum omnium octavi aetas celeberrimo. Visit ann. LX.
mecl. Mauro, the chief excelsior in his art. There are a few of
his works still extant. He was living in 1361.

(Vasari, 'Vite de' Pintori,' &c., and the notes to Schom's
German translation of Vasari; Della Valle, 'Lettere Scelte';
Lanzi, 'Storia Pittorica,' &c.; Rumohr, 'Italienische Forschungen.'

MEMMI DI MARTINO. [Simone, P. C. S.] MENANDER. ARRIUS, a Roman juris, of the time of
Severus and Caracalla. The work of his mentioned in the
Florentine Index is four books on Militaria. There are
six excerpts from Menander in the Digest.

MERCEN. [Simon P. C.] MERCER, LOUIS SEBASTIEN, a prolific writer on men
and manners, politics, science, the drama, literary crit-
icism, and many other subjects. The greater part of his
works are sunk in oblivion, but several of them still deserve
and obtain opinion.
He was born at Paris on the 5th of June, 1740. He was for some years professor of rhetoric in
the college of Bourdeaux. The works for which he chiefly
deserved attention at the present day are his attacks on the
manners and morality of his age. The first of these appeared
in 1771, with the title: 'L'Am 2440; Rêve, s'il en fut jamais.'
In 1781 he commenced the publication of the 'Tableau de Par-
is,' in which he preserved the attention of the French
authorship of this book which, by its bitter remarks on all
the social institutions of France, was sure to provoke their wrath,
he found it prudent to retire to Switzerland, where he com-
pleted this remarkable work. Without holding with its
author that the 'Tableau de Paris' produced the French Re-
volution, there is no doubt that it did much to open the eyes of
mankind to the immoral and corrupt state of the social
system of the French capital, and the inapplicability of the
great national institutions of the country to supply their proper
end. It is said that it was read by the Duke of Orleans,
with an animated, descriptive, and biting pen. He occasion-
appealed to a high sense of morality, but his chief power
lay in showing his readers the bad taste and the folly of the
prevailing habits of the day. Wherever he had to depict
honest industry struggling against false social laws, or the
remains of pristine simplicity holding out against the inroads
of corrupting manners, his tone is dignified and feeling. In
the latter case he ably and ingeniously commented on the
artificial and vicious tastes of the leaders of fashion, of the
triumph over the free expression of opinion, he overwhelm-
his sarcastic ridicule. The work is a curious anatomy of
Parisian society, and exposes many evils incident to large cities,
of which the lapse of sixty years has not entirely enabled us
to find the remedy. The sanitary regulations which have
lately so much occupied the attention of society, and other
means of social organization, are intended to supply deficien-
cies which Mercier points out in his own peculiar fashion:
whether he could have devised remedies for the defects he
then discovered and questioned. He was an author burdened
with paradoxes. In 1801 he published 'Néologie, ou Vocabulaire
de Mots nouveaux, à renouveler, ou pris dans des Acceptions
nouvelles,' a work in which he announced such propositions
as: 'Les mots 'parfaits' et 'parfaits' sont des mots en pro-
vice de la langue,' according to the chief ornaments of French literature; seeming, wherever
public opinion had unequivocally declared itself, to find that
he had to perform the function of reversing the judgment.
In philosophy he was equally paradoxical, and contended
against the best-established truths in physical science.
From these peculiarities his attacks on the social morality of
his age have been received as chance blows struck in a right
quarter by a man of extraordinary originality. The chief
virtue of his 'Tableau' has thus frequently been looked on as no more
the result of just observation than the censorious remarks of
a universal grouch, who, living in a brothel or a gambling-
house, should condemn the principles and customs by which he was surrounded. But Mercier deserves
a better appreciation, and none can attentively read his
works without seeing that they proceed not only from a con-
ception of what is wrong, but a sense of what is right. A
list of his works would be much longer than the present
article. He passed a life of cheerful vivacity, surrounded by
friends who seem not to have been the more anxious to
please him that he perpetually displayed with singular simplicity his sub-
lime self-conceit. He died on the 25th of April, 1814.

MERCURIUS, a genus of plants belonging to the na-

MERCURY, DEPRESSION OF. [Depression of
Merician, Matthew, a very distinguished German
portrait painter, who received the authorities to
name the same name, who was born at Basel, in 1693, where the son
was born in 1821. He was the pupil of Sandrart, who was
much attached to him; he studied also after Vandyck in Lon-

don; became acquainted with Le Sueur and Vernet in Paris,
and studied underSucchi and Carlo Marsatti at Rome. From about 1834 to 1837 he was in the main chamber of the Vatican, engaged in correcting his father's book and print business, at Frankfort on the Main, but he did not give up his own profession. He painted the Emperor Leopold I. on horseback, and many other German and foreign sovereigns. His works are amongst his most finished pieces, and engraved a few plates, which are marked M. Merivale, junior. He died at Frankfort, in 1867.

Matthew's sister Maria Silvya Merian was an eminent in società painter. She died at Amsterdam in 1777, aged seventy. [Sander, Teutsche Academie, &c.; Fiorillo, Geschichte der Zeichnenden Künste, &c.; Drury, Life of Herman, J. Rees, and J. G. C., &c.;] Thos. HERMAN, was born at Exeter in 1779, in which neighbourhood his father, John Merivale, Esq., resided, and was possessed of some landed property: his grandfather, the Rev. Samuel Merivale, was a Presbyterian minister at Exeter, and tutor at the dissenting theological academy there. Mr. Merivale entered St. John's College, Cambridge, in 1797, but took no degree, in consequence of the impediment of his dissenting persuasion, although at a later period he joined the Church of England. He married Louisa, daughter of the Rev. Dr. Drury, head master of Harrow School; she was called to the bar in 1805, and practised in the Court of Chancery. He published three volumes of Chancery Reports from 1811, of 700 pages, decided by Lord Eldon and Sir William Grant. In 1825 he was a member of the committee for inquiring into the state of the Court of Chancery, which was appointed in consequence of the financial crisis of 1825, when the Court was near bankruptcy, and wrote 'A Letter on the Chancery Commission' in 1827, as well as some other pamphlets on law reform. He became a commissioner of bankruptcy on the then newly organised system in 1831; and continued to hold that office till his death in April, 1844. From his early youth Mr. Merivale was addicted to literary and antiquarian pursuits, especially to the study of Italian and, in his later years, of German literature. He contributed a large proportion of the translations contained in the 'Collections from the Greek Anthology,' published in 1813 under the editorship of the Rev. Robert Bland; of which Mr. Merivale brought out a second edition, enlarged, in 1833. In 1814 appeared his poem of 'Orlando; in Roncesvalles,' a tale in the ottawa rima, being chiefly a free abridgment of part of the 'Morgante Maggiore.' In 1841 Mr. Merivale published two volumes of 'Poems, original and translated,' comprising most of his earlier pieces; and in 1844, shortly before his death, a volume of translations of the 'Minor Poems of Schiller, of the second and third periods, with a few of those of earlier date.' This perhaps was the most successful of his productions. It is an essay towards the rendering the lyrical pieces of the German poet in the same, or nearly the same, metre with the originals, and with as much of the slavish respect for the tone and character of the metaphysical or subjective poems of Schiller's later period—those which it is the most difficult to bend to this species of treatment—the Gods of Greece, the Feast of Eleusis, the Passion, and the Road of Life—those are among the best executed parts of the work. Mr. Merivale was an extensive contributor to literary reviews, but none of his prose essays on these subjects are published in a separate form.

MERSERISM. [Animal Magnetism, P. C. S.] MESOLO'NGHI or MESSOLON'GH, perhaps the antient Olenas, 'Oλένας, in Aetolia, a small town in Greece, lies on the northern side of the Gulf of Patras, near its entrance, and right opposite Cape Kologoria or Papa in the Morea. It became remarkable during the last Greek insurrection against the Turks, as is stated in the Life of Bozarias in this Dictionary; by an union of the inhabitants of the town, and of the forces of it by Ibrahim Pasha, the commander in chief of the besiegers. The heroic resistance of the Greek garrison, and their ultimate fate, made the name of Messolonghi popular with the Greek nation and in the English language. Messolonghi is built on the edge of a marshy plain, bounded on the north by the high ridge of Zygog, the antient Areynthos, which is protected towards the sea by a lagune extending about ten miles along the coast and five in breadth, and hence perhaps the name of the town, which seems to be a contraction of the Italian (Venetian) words 'mezzo' and 'laguna.' With the exception of a few very tortuous channels, the lagune is impassable for any craft drawing more water than the 'nonoxyla,' or small boats of the inhabitants. The main channel in the south is commanded by the mud-bank of Vassiladi, on which the Greeks had built a small fort and some houses in the north, by the town of Batoas and Anatoliko. At the time of the outbreak of the Greek revolution the town contained several thousand inhabitants, who derived wealth from their extensive fisheries. The fortifications were in such a condition that Bayle proposed to the Greeks to strengthen the place by additional works; but the Turks left them only time to add a rampart of earth faced with stones, and a ditch, which surrounded the town on the land side, and obstructed the progress of the 25th to the Turkish commander in Northern Greece, in the beginning of 1825, many Greek palkiers and others flocked to Messolonghi with their families, so that the garrison was increased to about 5000 fighting men. Their attacks were repulsed by the veteran Nothi-Bozarios, Sornari, Mitcho-Koutouyan, Liaketas, Lambro-Vieks, George Rizzo, Niketas, Takos, Makry, and others; and the body of officers was increased by many foreign volunteers, mostly German noblemen and gentlemen. On the 25th of April, 1825, Reshid Pasha appeared in sight of the town, with an army of 20,000 men and a numerous battering train, to which the besiegers could only oppose forty-eight bad iron guns of calibre varying from 4 dif 48-pounders, two brass 10-inch mortars, one howitzer of 5 inches, and one mountain howitzer of 41 inches. The Turks made the first trench on the 5th of May, and on the night of the 11th a terrible storm came on, and was accompanied by a hurricane, and the 27th and 28th, were, from the 12th to the 15th, and from the 18th to the 20th, a perfect gale, and the topstee of the buildings, and the stormings now succeeded each other during two months, but the fire was well answered from the rampart, and the Greeks made frequent sorties, in which they always defeated the enemy. The Greeks were able to throw up a line of works specially on the 2nd of July. The Hydriotic fleet stationed at the entrance of the lagune, there was no lack of ammunition and provisions in the town, till, on the 3rd of May, the Turkish fleet appeared off the place, and, after having obliged the Hydriot to avoid a certain defeat by a hasty retreat, landed a strong body of Turks, under Husein Bei. On the 28th of July, the 2nd of August, and in the night of the 3rd, the fortress was furiously assaulted, and a terrible cannonade carried destruction among the houses and their inhabitants; but the Greeks stood their ground, and were excited to hope of certain victory when, a few days afterwards, the Turkish fleet under Mauilis and Sakhtouri came in sight, and after a severe conflict defeated and dispersed the Turkish fleet. The maritime blockade was now at an end, and in the beginning of September the garrison was still 4000 strong, with an additional population of 10,000 women, children, aged or infirm men. Reshid Pasha, however, was far from being discouraged, and resolved upon still more vigorous attacks; but Sultan Mahmud, who was then possessed upon the importance of Messolonghi, gave orders to Ibrahim Pasha, who commanded in the Morea, to take the chief command, while Reshid Pasha was to act as his first lieutenant.

The Egyptians then moved northward, and towards the end of November the combined fleet of Turkey, Egypt, and Barbary, drove the Greek fleet from the lagune, and kept a strict watch over its entrance. During the whole of the months of October and December the Turkish fleet passed without the Turks making an assault. In the first week of January, 1826, Ibrahim Pasha appeared in the Turkish camp with 14,000 Egyptians and an ample supply of provisions and ammunition. During the first fortnight he was nearly inactive, hoping that a strict blockade would compel the inhabitants to surrender for want of food, nothing having been introduced into the town since the end of November. Although the inhabitants were on the verge of starvation they would not capitulate, and continued their deadly sorties, when at last, Ibrahim, after having taken the islands of Poro and Anatoliko, made the town a heap of ruins by the destruction of the whole town and eighteen churches, character—are among the best executed parts of the work. Mr. Merivale was an extensive contributor to literary reviews, but none of his prose essays on these subjects are published in a separate form.
driven back within the fortress, or massacre prisoners while in the midst of the enemy's army. Their ammunition and food being completely exhausted, so that even cats and rats were devoured, the morrow, the garrison resolved to cut their way through the enemy lines and retreat into the neighboring mountains. According to the best authorities the population consisted in the month of April, of about 400000 persons, fighting men and women, almost all being bound upon the besiegers and cut a way for 6000 women and children, while the retreat was to be covered by a thousand men, and the fortress guarded by a few devoted warriors who were to burn the city and sacrifice their lives to their brethren. The 22nd of April was the day on which the Greeks were to try their last chance. But the plan was betrayed to Ibrāhim Pasha by a Hungarian deserter only a few hours before its execution, and the inhabitants of Mosoulah appeared outside their shattered stronghold, they were suddenly surrounded by the main body of the Egyptians. A dreadful conflict ensued. Five hundred men were cut down by the infuriated besiegers; 1800 persons, of whom 200 females, were females, escaped, of whom, however, 600 were starved to death in the mountains; and Ibrāhim boasted of having taken prisoners 5000 soldiers, and from 3000 to 4000 women and children, and many of the captives were afterwards ransomed through the exertions of the Philhellene societies in Europe. Notghi-Bozari and Mitche-Koutanyi, though both upwards of seventy, escaped safety. Among the slain were Joseph Butsh of the Papadias, the General Stournas, Sadiunas, and many other Greeks of note. Among the German, Baron von Riedesel and Lieutenant Rosser were killed during the siege; Colonels Dittmann and Perrot, Captains Mullow and Stilzelberg, Lieutenants Klemp and Schipan, and several other gentlemen fell in the sortie. With them remained on the battlefield Dr. Meyer, another German, who was the editor of a German periodical. He said that he was equally partition between his pen and his sword: "his wife and children were dragged into slavery. 'History will do us justice,"' wrote the gallant doctor, a few days previous to the last sortie, to a friend--and postscript went over our master, My the relation I have drawn up of the siege survive me.' This relation was unfortunately lost.

Thus fell Mosoulagh after a siege of twelve months and after 100000 shot and shells had been exchanged between the besieged and the besiegers. Its melancholy fate excited the sympathy of all Europe, and there is scarcely a modem language in which poems were not written on the heroes of Mosoulagh.

(Gordon, History of the Greek Revolution.)

MESOPOTAMIA (from the Greek μεσός, 'middle,' and ὅπως, 'a country between,' is a term which was used by the Greek and Roman geographers (Strabo, and others) to comprehend all the countries which lie between the rivers Euphrates and Tigris, and it is still in use. The Arabians call this country by the names of Al-Isirah, or the island. As Mesopotamia is not a political division, geographers do not agree as to the extent of the countries to be comprehended under this name. Some consider it to be the central countries, or those lying between the 38° N. lat. and the Chalde or Median Wall (34° N. lat.), whilst others extend it northward to 40° N. lat., or the sources of the Euphrates, and southward to 30°, where the Tigris and Euphrates unite. We shall here give a description of the countries included between the parallels of 40° and 30° N. lat.

When a traveller departing from Trebizond or Rizeh, on the northern coast of the Black Sea, directs his course southward, he passes over several mountain ridges running east and west, and is soon aware that the country rises rapidly. About seventy miles from the sea he finds himself on the most eastern point of an island which is united to the continent of Asia from east to west, and which in ancient times went by the name of the Taurus and Antitaurus. This northern chain is traversed in its length by the parallel of 40° N. lat. but a little south of it, and the higher lands are always covered with snow, and many summits are 10000 feet above the sea-level. From these mountains the view ranges so far as the eye can reach, to several elevated table-land, that of the Euphrates and Murad, which is bounded by the parallel of 38° and 36° N. lat. in the East, and by the parallel of 30° N. lat. in the West, and whose surface varies from 3000 to 6000 feet above the sea-level, but several of the mountain masses attain 10000 feet. On the other hand, it varies between 89° and 90° N. lat., and the kline region of Mesopotamia, or the alluvial region of the Taurus. The country here sinks gradually from 2500 feet to 1000 feet and less above the sea-level. It is succeeded on the south by the great desert plain of Mesopotamia, which encircles the whole Persian gulf between the two rivers, or between 36° 30' and 34° N. lat. This region is as low as the Arabian plain of Babylon by the Chalde or Median Wall, which begins on the banks of the Tigris, near 34° N. lat., and it terminates between 36° 30' and 36° N. lat. This wall and the lower course of the two rivers up to their junction, enclose the fourth region, the plain of Babylonia, or of Irak Arabi.

1. The table-land of the Frat or Murad lies between 40° and 38° N. lat., and between 38° and 44° E. lon. In width from north to south it extends about 100 miles, and in length from east to west about 250 miles. This gives an area of 5000 square miles, or 10000 square kilometers, It is the most elevated portion of the high grounds by which the table-lands of Asia Minor are connected with the great table-land of Iran or Persia.

The elevation of this table-land varies greatly. The highest part is on the north-east corner, where the lowest part of the country is about 6000 feet above the sea-level. Hence it descends rather rapidly along the banks of the Frat or Karasu, for Erzerum is nearly 4600 feet, and Erzincan probably not more than 4000 feet above the sea-level; where the Frat meets the Murad the elevation is less than 3000 feet. The descent along the Murad river is somewhat less rapid, as the town of Basrah is only 1500 feet above the sea; at Palu the level of the river is 2819 feet above the sea.

This table-land has a very unequal surface, but the inequalities constitute large masses. The Kop Dagh, which forms the southern border of the Murad, rises in the north to a height of 10000 feet. Its northern face, or that which looks towards the Black Sea, is well wooded, but on its southern declivity there are no forests. Another mountain-chain, called the Khasran Dagh, runs in a north-west direction, and the place where the Euphrates makes its great bend opposite the town of Malatyah. Towards the east this range rises from 7000 to 8000 feet above the sea-level, for the mountain-passes which traverse it are from 6000 to 7000 feet high; but it appears to be lower towards the west; and that portion of it which surrounds the source of the Tigris is only 5000 feet high. This appears also to be the general elevation of this mountain-mass where it comes close to the bed of the Euphrates, where this river forms its three hundred cataracts between Isgol or Fisgolu and Gergor. No mountain-range over two thousand feet is to be seen on the east of this table-land, a level between the Murad and Araxes rivers. But west of the source of the Murad the Ala Dagh rises above the snow-line, and it appears to be an isolated mass. Much farther to the west, in the north-west of the table-land, are two mountain-passes, of which the eastern is called Bingol Tagh, and the western Dukj Tagh. The declivities of the last-mentioned range are so great, that the banks of the Frat above its confluence with the Murad. The two mountain-passes are probably separated from each other by a wide depression, and both rise above the snow-line.

Those parts of the region which are always covered with snow do not appear to cover a considerable space, but from their declivities mountain-streams descend, which are always copiously supplied with water. This circumstance, united to the great extent of snow, which during the winter months, makes this table-land one of the best-watered regions in Asia; and the whole surface, with the exception of the most elevated parts, may be turned to useful purposes. The largest part of this table-land is intended for cattle and sheep, but the higher parts are covered with wood, especially as sheep-walks. The number of sheep must indeed be great if there is no exaggeration in the statement that one million and a half of sheep are sent annually from this region to Istanbul and Thrace for the market. They arrive at the place of their destination after a journey of eighteen months, and one-third of them are said to perish on the road. Large rocks are also sent to Durack, Arslan, Aleypo, and Damascas, and even as far as Egypt on the...
The surrounding country is very fertile, and considered the most populous portion of the table-land.

II. The Hilly Region of Mesopotamia, or the Chelva region of Mount Taurus, lies to the south of the Kzarzan Tagh, from which it extends southward along the left bank of the Murad—er-en-road which runs from Bir-ed-jik on the Euphrates, to Mosul on the Tigris, past Urfa, or Orfa, Marvun, and Nisibin. This caravanserai lies along the base of the Hilly Region. This region lies between the parallels of 37° and 38° N., and 43° E. long., and extends about a hundred miles from north to south, and two hundred and fifty from east to west, so that its area may be roughly estimated at 25,000 square miles, or equal in extent to the table-land of the Frat and Murad.

This country may be considered a continuation of the table-land of the Frat and Murad, or rather as a southern terrace of it. The northern districts are about 6500 feet above the sea-level, from which elevation it gradually descends to about 1000 feet, or somewhat more, where it is contiguous to the Great Desert Plain of Mesopotamia along the caravanserai. Only the most eastern part of this road between Tell Ramalan and Mosul is at a lower level, and runs through the Great Desert Plain.

The highest part of this region is that which is on the west borders on the banks of the Euphrates between Issghin and Gergur, where the river forms its three hundred cataracts, and on the east on the upper course of the Tigris between its source and the town of Diyarbekr, which is nearly 5000 feet above the sea; the source of the Tigris are only about 2000 feet.

The level of the surface of the Euphrates near the confluence of the Frat and Murad is upwards of 2600 feet, and at Gerber it is about 2800 feet, while the highest places are masses which rise abruptly from the water's edge, at many places perpendicularly, generally attain near the river an elevation of between 3000 and 8000 feet, and a greater height at some distance from it. The highest portion of this tract must therefore be more than 5000 feet, and it may be 6000 feet. It does not, however, appear that any portion of it rises so far above the general level of the masses as to form conspicuous summits.

This tract is little known. In all depressions there are small villages surrounded by walnut-trees, and a little cultivation, but the inhabitants derive their subsistence chiefly from their cattle and sheep.

East of this mountain tract lies the Plain of Diyarbekr, or of the Upper Tigris, which extends from some miles west of the town of Diyarbekr to some distance east of the town of Sert, about 120 miles in length, and from the Kzarzan Tagh on the north to the Karaja Dagh on the south, about 40 to 50 miles; on the east it is shut up by the most elevated part of the mountains of Kurdistan. It is a most valuable part of Western Asia, especially that portion of it which lies on the land towards the Persian Gulf, where the climate is very healthy and pleasant for the cultivation of the Kzarzan Tagh.

The declivity of this range is not so steep as that which descends to the banks of the Murad, and the slopes are in many places intersected by terraces from two to three miles in width. These terraces are cultivated by the inhabitants of the Murad Massa, but they are cut by wide valleys, which descend from the summit of the range to the plain below, and in which the waters collected on the top, which for many months of the year is covered with snow, find their way to the lower country. Rich crops of wheat and barley are obtained everywhere, and in some places, where irrigation can be practised, rice is grown. The sides of the hills which enclose the valleys, and the valleys themselves, are partly covered with orchards and plantations, consisting of walnuts, figs, vines, pomegranates, mulberries, and the fruit-trees of Northern Europe. In some places cotton, melons, and platanus are grown to some extent.

The deep valleys on the mountains are thickly covered with woods, in which two kinds of oak abound, one of which yields gallnuts, and the other a kind of manna, which is much used in the country. In some parts the steep declivities of the hills have been terraced into very good arable land, which is planted with fruit-trees and irrigated.

The Plain of Diyarbekr itself is less fertile, and not cultivated with such care as these valleys. Its surface may at the lower part be about 1700 to 1800 feet above the sea-level. There are many terraces which are quite level, and others have an undulating surface; a few are hilly. The rivers, especially the Tigris, run along the level of the country, which renders it difficult and expensive to use the waters for irrigation, and as the summers are hot and dry, only those tracts can be cultivated which have a better soil. The others are only used as pasture-ground.
during the wet season, and until the grass is dried up by the heat. In some parts the surface is bare of mould and consists of naked rocks. There are no trees on this plain except mulberry and poplar, which are planted in some places. Corn and barley are grown, and some cotton, and also maize. In the vicinity of the town of Diarbekr cultivation is carried on with more vigour: flax is also grown.

At a distance of some miles south of the Tigris, where the river runs from west to east, the plain is bordered by rocky masses, which rise with rather a steep ascent to 2000 feet above the general level of the plain. Though they appear for a distance like a line of mountain, they are really composed only of the outcrop of a table-land which occupies the whole country between the Euphrates and Tigris, north of 37° N. lat. and compiles the Tigris to run eastward, from the Euphrates west and north of 38° N. lat. These two rivers are hardly thirty miles apart; but sixty miles farther south, between Rumkalah on the Euphrates and Jezirah Ibn Omar on the Tigris, they are more than two hundred and twenty miles from each other. The highest part of this table-land runs from north-west to south-east, beginning at no great distance north-east of the town of Severock and terminating with the hill on which the town of Mandrin is built. This ridge it appears is properly called Ras el Dagi. This region has no watercourses, though a considerable quantity of snow appears to fall during the winter months. This must chiefly be attributed to the limestone, of which the whole country is composed, and which quickly absorbs all the water. Where this is the case the country generally presents bare rocks, or only a very scanty vegetation during the wet season. But the plains composed of alluvial deposits are covered with grass, and the tracts which are crossed with basaltic strata are covered with grass, and the tracts which are crossed with basaltic strata are covered

The whole country is imperfectly known, especially the portion contiguous to the Tigris, which has been visited by European travellers only in the vicinity of the river. Where the bed of the river is narrowed by the mountain-masses advancing to the water's edge on the east from the mountains of Kurdistan, and on the west by the Karke mountains, the surface of the table-land is nowhere broken by valleys and ridges, interspersed here and there with elevated plains. The valleys are well cultivated, and produce wheat, rice, cotton, tobacco, cucumbers, and melons; some of them have good vineyards. The ridges are well covered with oak, pine, holly, elm, and several bushes. The plains afford good pasture-grounds, and are also partly cultivated. Farther inland the country appears to be more uneven, as the inhabitants are able to defend the Turkish government and to maintain their independence; but according to the accounts of the natives there are many fertile valleys in it. If their accounts deserve credit, the eastern districts are much more fertile than the western, where the want of moisture in the summer is so great that nearly the whole is a desert, with the exception of some depressions, whose surface is formed of basaltic strata, and where a few villages occur with some cultivation. In approaching the banks of the Euphrates the portion between the rivers, the Euphrates and the Tigris, is cultivated in several of their confluentes. There are also several kinds of turtles, snakes, and lizards.

The Hilly Region of Mesopotamia constitutes the pashalik of Diarbekr; but the most south-eastern districts are sometimes placed under the pasha of Mosul. The most remarkable places are situated either in the Plain of Diarbekr or along the mountain road between Bir-chek and Mosul. In the Plain of Diarbekr are Diarbekr. [Diarbekr, P. C., vol. viii., p. 477.]

North of Diarbekr, on the southern declivity of the Khraran Tagh, are very rich mines of copper, in whose vicinity are two towns, one of which is called Arghana (or Arguna) Maaden, and the other Maaden Kapur. Arghana Maaden is built round the summit of a high hill, 3887 feet above the level of the river, the edge of the mass is split and indented, and numerous small valleys are cut through the high ridges. The country is not cultivated, but the largest part of the town is covered with orchards, consisting of olives, pomegranates, mulberries, pears, peaches, and quinces; all of these have also excellent vine plantations. In some parts cotton is cultivated. The country through which the caravan-road between Bir-chek and Mosul runs, has great variety of surface and soil. Between Bir-chek and Urfa it is hilly, and contains many cultivated tracts. Farther east, as far as Mandrin, cultivated and wooded tracts, mostly situated in depressions, or valleys alternate with plains, which in some cases afford pasture, and in others submerge the country. This tract of country the ridges running south and north rise to high hills, generally of a conical shape. These ridges continue to Nisibin, but are less frequent. Between them run some watercourses, which are crossed by basaltic strata, and occasional desert country, which lies farther south. East of Nisibin cultivation ceases; but as in this part there are numerous watercourses, the adjacent country has pasture even during the summer months. After El Rasouh a hill, called el Mesopotamia, enters the Hilly Region of Mesopotamia and enters the Desert. This region has a more temperate climate than the table-land of the Frat and Murad, on account of its less elevation, the mountains surrounding it on the east, north, west, and its more southern situation. But the climate is much colder than that of Europe in the same parallel, because it lies much farther from the sea, and does not receive the warm western winds prevalent on the Mediterranean, as the elevated chain of Mount Lebanon and Anti-Lebanon prevents them penetrating so far eastward. The thermometer has been observed to descend as low as 12° of Fahrenheit. In January and February a great quantity of snow falls. The spring hardy is preceded by a heavy rain in March, which is generally followed by which hardly any rain falls to the end of October, or the commencement of November. The thermometer rises to 56°, and all grass and minor vegetation dries up. Pasture is then only found on the lower part of the country, which is why in many places of the table-land. Nature becomes reinvigorated in the month of November, when the Nile clouds appear, and the waters proceed from Mount Lebanon eastward, and bring to the table-land very heavy rains, which about the beginning of the year are changed into snow.

If the Plain of Diarbekr is excepted, agriculture is limited to some tracts of moderate extent, to the numerous but narrow and short valleys, and a few plains and depressions which have a fruitful soil. The cereals which are grown are wheat, beans, barley, rice (in very few places), lentil, cicer arietinum, Lathyrus sativus, Secale cereale, Urtica, Holcus sordidus, and Medicago sativa. Other vegetables are several kinds of cucumbers, melons, solanum melongena, hibiscus esculentus, and pumpkins. The orchards and plantations of citrus fruits, citron, orange, and lemon, as well as the fourth species of figs, cherries, Armenian plums (prunus armeniaca), three other kinds of plums, apples, pears, quinces, cornelian cherries, almonds, walnuts, hazel-nuts, chestnuts, and cembra kernels (the latter species Carya cembra), castor-oil (ricinus communis), hemp, flax, safflower (carthamus tinctorius), cotton, and trigonum foenum-graecum, are also cultivated. Among the wild plants are capers (capparis spinosa), mustard (sinapis arvensis), liniacres (plenaria glabra), asparagus, and arum colocasia—the leaves of the last are used as paper.

Sheep, cattle, and goats constitute the wealth of the nomadic tribes, consisting of shepherds, nomads, nomadics (since a Khan), with the fat tail, which often weighs fifteen pounds, and the Arabian, whose tail is not much thicker than that of our sheep. Horses are numerous, but not so good as in the table-land of the Frat and Murad, or on the desert plains; asses are also kept in great numbers. It does not appear that camels are bred, but they are used on the caravan road.

The most common wild animals are wild boars, deer of two or three different kinds, wolves, foxes, fennel, jackals, bears, polecats, martens, marmots, hamsters (crictes vulgaris), squirrels, porcupines, and hares. There are several kinds of vaults, falcons, and owls; ravens, crows, jack-daws, thrushes, beccaz, and small birds, many of which also breed in both rivers, the Euphrates and the Tigris, and in several of their confluentes. There are also several kinds of turtles, snakes, and lizards.
Khorasan Toghi, is the town of Ilijch, which contains 1000 families, and where some cotton-stuffs are manufactured: in the neighbourhood maize is cultivated.

At the easter extremity of the Plain of Diaberk, within the Khorasan Toghi, in a very alpine country, runs a town called Biirk, on the sea-level, which contains 12,000 inhabitants, and carries on an active commerce with the adjacent countries and with Persia. It exports wool, tobacco, galingale, and gun-ungaeh, which are the produce of the country. From Persia it imports cotton for the manufactures of the town, which appear to be numerous; it has also several dyeing-houses and distilleries.

The southern termination of the Plain of Diaberk, not far from the base of the mountains of Kurdistan, 2750 feet above the sea-level. It contains about 5000 inhabitants, many of whom are engaged in dyeing red the cotton-stuffs of Bugs and Ilijch.

Along the caravan-road are the towns of Urfa or Orfa, Mardin, and Nishin. Urfa (Ora, the antient Edessa), the most western, is at the base of a hill, and is a well-built large place, which is frequently compared with Damascas. It is surrounded by high and strong walls, seven miles in circuit, and has between 40,000 and 50,000 inhabitants. It is not said that any branch of industry is carried on. The most remarkable part of the town is the grand mosque, which in its exterior and interior exhibits a considerable degree of magnificence. With this building are united several medresses, where a number of young men are instructed in the religion of Islam. Mardin, which is nearly at equal distance from Bir-eh-jik and Mosul, is built on the summit of a steep limestone hill, which may be considered as the termination of the Khasam Desert, and is about 2000 feet above the plain lying south of it. The population is differently stated between 10,000 and 15,000 individuals.

Nishin (the antient Nissia), farther east, had sunk down to the condition of a miserable village, but in modern times the Turks have begun to rebuild the town.

The town of Suverek or Severek lies on the direct road between Urfa and Diaberk, in a depression in the midst of the tableland. In its surrounding country it was raised to a considerable extent, and orchards are numerous. The place contains 2000 families.

The only place, except Diaberk, built on the banks of the Tigris which requires notice is Jezerib Ibn Omar (the Island of the son of Omar), which is built on an island in the river. It has long been the seat of a rebellious chief of the Kurds, and contains a population of about 1000. III. The third region, called the Desert of Mesopotamia, extends from the great caravan-road leading from Bir-eh-jik to Mosul to the Median Wall, or from 37° N. lat. to 33° 30' N. lat.; and as it forms the extreme of this vast plain, its northern extremity is nearly 300 miles wide; but the Euphrates and Tigris approach nearer to one another in their course to the south, the country grows narrower, and at its southern extremity it is barely 6 miles in breadth. It is about 500 miles north-west to south-east may be about 250 miles, and the average width about 150 miles. This gives an area of 37,500 square miles, or about 10,000 square miles more than Ireland.

This country has been called a desert, not on account of the sterility of the soil, but because till very recently we have been entirely unacquainted with its productive powers. That portion which has lately been seen by European travellers is far from being a desert, and has given rise to the opinion that in Mesopotamia there does not exist any tract of country of considerable extent which is covered with sand and utterlysterile, though a large portion of it is covered with horizontal layers of sandstone, which only during a small part of the year are clothed with grass and plants. But, on the other hand, there are some districts which exhibit a considerable degree of fertility.

The level of this region at its northern extremity and in the vicinity of Mardin, is between 1200 and 1400 feet above the sea, but it decreases as it approaches the river; Mosul on the table of its numerous mudhouses is the grand mosque, 650 feet above the sea-level. The course of the rivers and streams shows that it descends towards the south. At its southern extremity near the Median Wall it probably does not exceed 1000 feet above the sea.

The country is a plain, but there are a few isolated ridges of high hills, which however do not cover a great extent of country. The best known of these ridges are the Jebel Makhul on the banks of the Tigris, between 35° 30' and 35° N. lat.; the Sinjar Hills, south of Nishin, between 41° and 42° E. long., and of north of 36° N. lat., and the Abil-al-alz Hills, between 39° and 40° E. long., and near 30° 30' N. lat. The precise situation of the last-mentioned range has not been determined.

The most fertile portion of this region is in the north-western corner, between the Abil-al-alz Hills and the Pyramids of the Euphrates, which runs along about 100 miles, and falls into the Euphrates at Raqqa. This region comprehends the districts which are known by the names of Saruj and Harran. The fact of the fertility of this tract has only lately been brought to the knowledge of the Turks and Egyptians, when the army of the Turks drew provisions from this country. On this occasion Mr. Answorth was informed that in Saruj alone were more than forty large villages, inhabited by agriculturists, and that twenty of them cultivated rice. The country is considered as the granary of Syria, and no part of the last-mentioned province can vie with it in fertility and agricultural productions. Harran, which lies to the east of Saruj, is stated to contain a large portion of alluvial land, and to be equally fertile. The degree of fertility of the Abil-al-alz Hills is not known, nor their extent and direction.

We are totally unacquainted with the tract between these hills and the Sinjar Hills, except that nearly all the upper branches of the Khabur river rise in this tract, and this leads to the presumption that this tract is well watered, and that it contains a fair proportion of land fit for cultivation. It is also stated to be the case with the valley in which the Khabur river runs southward and south-westward until it reaches the Euphrates, near the castle of Rehabe, after a course of probably two hundred miles, about 100 miles in breadth.

The country between the caravan-road and the Sinjar Hills is nearly a level plain, which even at the end of the dry season is mostly covered with coarse grass and prickly plants. In some places there are tracts of marshy ground with long reeds, and interspersed with many large pools of sweet water; but at some places the soft soil is impregnated with salt. There are in this part considerable hills from 80 to 150 feet in height; they appear to be artificial. The portion of this tract which is under cultivation is small.

The Sinjar Hills run east and west with a slight inclination to the south. They extend in length about fifty miles, and in breadth from seven to nine miles. The highest part of the hills is near the eastern extremity, where they rise above 1500 feet above the plain. This is an agricultural district. Considerable quantities of wheat, barley, and bazaaria, in the lower and more level parts, and the sides of the hills are covered with plantations of fig-trees and vines, which yield articles of export. A portion of the hills is covered with oak trees, the acorns of which affords a staple article of food to the numerous wild boars which frequent the hills. The number of the inhabitants, who are Yezidis, is stated to exceed 6000.

The plain between the Sinjar Hills and the Tigris has an undulating surface, and is for the most part barren, and covered with coarse scanty grass and thorny shrubs; there are large tracts of barren marshy soil, strongly impregnated with saline matter. The most common vegetable production is an eat-grass, which at many places covers tracts of several miles in extent, to the exclusion of all other plants, except a few flowers. Cultivation is only carried on in some of the beds of temporary watercourses, and between some low ridges of rocks, where wheat and barley are cultivated. Some tracts are covered with wormwood. In the vicinity of the Tigris the cultivated tracts are more extensive, not on the higher grounds, which are covered with a black burnished fescue above the level of the river, but in the bottom of the Tigris. This river flows here in a valley from eight to ten miles wide; the projecting headlands of the higher country form large embayments called hesas, which have a fertile alluvial soil, overgrown in their natural state with grass and small tamarisks, but where cultivated giving abundant crops of grain or rice.

In proceeding from Mosul southward the cultivated tracts decrease in number, as the agricultural inhabitants are too much subject to the predatious incursions of the Shummar Arab who are in possession of the uncultivated interior of this part of Mesopotamia.

The Jebel Makhul extends about forty miles along the banks of the Tigris, and at a very short distance from 35° 30' close up to Vol. II. — 2 P
the banks of the Tigris from the south-east. The Jebel Makhul may rise about 600 feet above the level of the river: it consists mostly of tuffs, and is composed of one mass of tuff in the present compass. In its present state it is a waste plain, but its western base is a large tract of country with a sandy soil, which contains a great number of bitter wells that are frequently visited by the nomadic tribes of the Arabs. The banks of the Tigris are much higher than the plain of Tefrit, and the town of Tefrit is uninhabited on account of the neighbourhood of these tribes. Between Tefrit and the Median Wall the alluvial tract on the banks of the Tigris grows much wider, and appears to have been of late years an extensive tract of swamp land, which was irrigated from a large canal which still exists under the name of Ishaki, and extends from the town of Tefrit to Bagdad; a great number of smaller canals of irrigation are connected with it. But the present course of the river, which maintains its course, as the whole work has gone to decay from want of attention; and this tract, which has an exceedingly fertile soil, is without inhabitants, and almost without cultivation, except a few isolated spots.

The higher ground west of this alluvial tract, as far as the river Tharthar, has an undulating surface, consisting mostly of long ridges, and depressions between them, not unlike the waves of the sea. In the valleys between the higher grounds the soil is moist even at the end of the dry season, so as to afford pasture-ground nearly the whole year round. But the best pasture is in the valley of the river Tharthar, which flows into the Tigris. This river is said to rise at the base of the Singir Hills. It runs parallel to the Tigris and about twenty miles from its banks. In May it was found to be between fifteen and twenty feet deep to seven feet deep. Its course may perhaps amount to one hundred and fifty miles. The water is brackish in summer, but not unpleasant to drink. The bottom in which this river runs is sometimes a mile wide, but in other places narrowed by the projecting headlands of the higher grounds to two or three hundred yards. It does not appear to be cultivated, but on the western bank are extensive ruins of Al Hadr (the ancient Hatra), which must have been erected in a country which was well cultivated. The Tharthar falls into a salt lake, somewhat north of 34° N. lat.; this lake is called El Mill, or the Lake of Ashikil; its extent is not known. The country west of the Tharthar river, as far as the banks of the Euphrates, is entirely unknown. It is said that at some places rock-salt is found in this desert.

The country contiguous to the banks of the Euphrates is much better cultivated than that which skirts the Tigris. Between Bir-chilik and Balis the Euphrates runs in a narrow bed between very high rocks; there is no bottom on the banks of the river, and the adjacent country is sterile and uncultivated. But between Balis and Racca the high grounds present a low and rounded character, and the river rises from one mile to six miles distant from the banks of the river. The bottom in these parts is an alluvium. On the banks of the river are tamarisk-bushes. A great part of the low land is overflowed, and the more extensive tracts between the swamps are either overgrown with tamarisk-bushes or used as pasture-ground. There is hardly any cultivation. In these parts the bed of the river is wider, and there are several islands of date-trees.

At the mouth of the Khabar river are some extensive woods, composed of high trees, especially tamarisks and poplars. Lower down the low and level flats increase in extent, and here also cultivation is much more attended to, but still by far the greater part of the bottom is swampy, or only partially cultivated as pasture. The number of islands increases as we proceed farther south; they are partly bare and partly well wooded with tamarisks. Before reaching Annah cultivation begins again to be more general. Round this place a large tract is well cultivated; corn, cotton, French beans, and sesame are raised to a great extent; the plantations of dates are extensive, and the numerous orchards yield oranges, lemons, pomegranates, figs, and olives. The olive-tree is not met with farther south; but the other trees and branches of agriculture are greatly attended to, in the bottom of the Euphrates as far down as Hitt.

The banks of the river present a continual plantation of date-trees; and between them and the low, rounded, gently sloping hills at the back, the bottom is, with the exception of some swampy ground, a high state of cultivation, and full of villages. A great part has been devoted to the irrigation of this part of the valley, which has been sowed to the system of irrigation which has been introduced. A great number of canals traverse the river bottom in different directions, extending from 200 to 3000 yards from the banks, and their water, raised by machinery, is distributed over the adjacent lands. The numerous islands which occur in this part of the course of the Euphrates are mostly cultivated, and on some of them towns are built.

Opposite to Annah, the bottom is only a mile wide, and nearly without vegetation, as the surface is mostly composed of gravel, intermixed with flint and pieces of chalk. There are only a few date-trees, poplar, and tamarisks; and the land is mostly a continuation of the plain of Tefrit and the bottom of the river. Below this place the high grounds disappear entirely, and the whole country is very little elevated above the level of the river. The soil of this tract is extremely soft, and as the banks are close to the river, which was irrigated from a large canal, the water of which is greater than 100 feet high. There are no longer any canals, nor any cultivation. The whole tract is in possession of nomadic tribes, who find here during the dry season abundant pasture for their buffaloes and horses. The number of islands in the river decreases, and they are not longer cultivable; their soft soil consists of sand and mud. Such is the country between Hitt and the Median Wall.

The Median Wall runs from the banks of the Euphrates to those of the Tigris. Its southern extremity is said to be on the Euphrates, a little above Shab; but at this point it has not yet been recognised by European travellers. Its northern extremity is found somewhat north of 34° N. lat.; so that it runs in a straight line from N.N.E.E. to S.S.W. for 130 miles, being on an average 25 long paces thick, with towers or buttresses on its western face every 25 paces; and on the same side it has a deep ditch, 27 paces broad. Near the Tigris it is built of the small pebbles of the country. It is from 8 to 12 feet in height. The natives say that in places far inland it is built of bricks, and in some parts worn down with the desert. According to their tradition it was built by Nimrod (Nimrod) to keep off the people of Niniveh (Nimrûd), with whom he had an implacable feud; and they call it Shad Nimrûd, or Chalû (embankment). We know nothing of the antiquity of this wall, except that it is mentioned in existing n. c. 401, when Shalmaneser and Greeks were commencing their retreat from the field of Cunaxa. Xenophon (Anab. ii. 4) describes it as built of baked bricks lying in asphalt, as 20 feet wide and 100 feet high; the length was said to be 20 parasangs (600 Greek stades); and it is not far distant from Babylon.

Our knowledge of the climate of this region is limited to a few general notices. The heat in summer is very great, and no rain falls up to the middle of November. During November and December the rain falls in frequent and heavy showers, but is not continual. In January and February there is a good deal of frost, and after the spring has commenced in March and April, the earth is searched there as elsewhere. The heaviest rains fall in the month of May, when the heat becomes so much less as to dry up the pasture of the swamped parts, and compel the nomadic tribes to seek shelter in the higher and drier parts of the country, and return to the Euphrates, and to the valleys of the Tharthar and Khabar.

This region is divided by the pashalis of Mosul and Bagdad. No remarkable places are found, except the towns built on each side of the two rivers which enclose the region. On those of the Tigris are Mosul [C. P. C., vol. v., p. 447] and Tekrit, which is built on a cliff, and occupies the eastern part of the site of an ancient town, the ruins of which are very extensive.

The largest towns on the Euphrates are in the fertile tract which extends from Annah to Hitt. Annah (the ancient Anatho), which is partly built on the western bank, and partly on an island of the Euphrates, contains 1800 houses, and is considered the capital of the Arab tribes inhabiting the west of the river. Farther down lies Hedinah, on an island in the river, in the midst of date plantations, and contains more than 400 houses.

El Us is a considerable place, and like Annah partly built on an island. Jibbab, another town built on an island, contains 500 houses, and is a thriving place. Hitt (theSite of the old city of Resafa, i. 179) contains 2000 houses, which are mentioned by Herodotus. It is built round a hill, and has good houses of stone. In the vicinity there is very little cultivation, and the inhabitants derive their subsistence from making salt, preparing goat's hair, and manufacturing little earthquakes.

The number of bitumen springs in the neighbourhood of this place is very great, and the produce of a single spring is sufficient to meet the demand, though it is used in these parts as an article of food. A great number of rivers, and forms are made here. They consist of wicker-work,
made of branches from one and a half to two inches in thickness. The interstices are filled up with bark or straw, and then the whole is caulked with bitumen. In such boats the bitumen, salt, and prepared lime are taken to Hilma, Basoom, and other places by which numerous small vessels pass through the channels which lead from the main river to the coast. These small vessels are the black tents of the nomadic Arabs. By this canal the wicker-boats of Hilt bring the produce of the country contiguous to that place to Bagdad, and it has twice been navigated by steamers. Before the Tigris it falls into a large lake called the Hor, which lies west of the town of Bagdad; a canal about five miles long called Mosaic, carries the waters of the Hor into the Tigris. It is also navigable for steamers.

The Samawiyah is considered to be the Is canal of Albufla, who mentions three other canals farther south, which cross the whole width of Babylonia, and these canals still exist. They are called, from north to south, the Nah Abu Gharib, the Nah Melik, and Nah Dhiyah. We have no particular account of these canals. These four canals leave the Euphrates between 35° 30' and 39° 30' N. lat. The mouths of some other canals are seen farther south, as far as the ruins of Babylon, but it is not known how far they extend inland.

The principal canal in the southern districts of the plain of Babylonia is the Shat el Hiyek, which carries the water of the Tigris to the Euphrates. It leaves the Tigris opposite Kut el Amarn, a miserable village on the eastern bank of the river, near a hundred miles below Bagdad in a straight line, and in a time of flood runs 178 miles in its bed, and is called the Shat el Hiyek. It runs more than a hundred miles southward, and enters the Euphrates nearly opposite Arge or Abbe, about fifty miles above the confluence of the two great rivers, on the banks of which the Turks built the Bost Jeirnit and the eastern Sayid Nawain; their mouths are about five miles apart. The tide ascends the Euphrates as far as Arge. This canal is dry in summer, but during eight months it is navigable, and in winter it is 150 feet wide and rather more than two fathoms deep. In this period of the year it was navigated by a steam-boat during the late Euphrates expedition; but only the western branch is navigable, the course of which is confined to the channel of the settlements, and a considerable traffic is carried on by it. At no great distance north of the western mouth of the Shat el Hiyek is that of another large canal called the Shat el Kar. It runs also from north to south, but it is not known where it originates, and whether its northern extremity is connected with the Nah Dhiyah. It was crossed by Fraser at a considerable distance above its mouth, where it was from 30 to 40 feet wide, and knee-deep in summer, but in winter it is fordable only in a few places. Like the Shat el Hiyek, it is navigated by the river boats, which are made at Hilt.

The banks of the Euphrates, from the place where the Sablawiyah canal meets, to a certain point, that runs about 20° to the east of the Sablawiyah, are of moderate height. The country adjacent to them is of indifferent fertility, and is mostly overgrown with grass, which is sometimes deep enough to float a boat. The few spots on the banks, and the pastures-grouds near them, are also indifferent, the number of cattle, sheep, and goats is not great. It appears to be but little inhabited, and only from time to time a grove of date-trees is seen.

The country near the sea, on the coast of Persia, is large portion of it is under cultivation, and the plantations of dates are more numerous. It is a populous country: between Hilla and Dhiwanyeh a number of large villages are observed, the population of which was estimated by a traveller at 10,000 individuals.

A short distance south of Dhiwanyeh begin the marshes of the Euphrates, which, lower down, are called the marshes of Lembayun, or Graham Inlet. About 30 miles north of the Castle of Fuljiah, and not far south of the place where, according to the accounts of the native, the Median Wall terminates on the banks of the river, and reaches the Tigris below Bajilid. Though the direct distance between the two terminations of the canal is not more than 45 miles, its length is 70 miles, because for two-thirds of its course near the Euphrates they are many benda; the last third runs nearly in a straight line, and is frequently fifty yards wide. But where its course is not direct the canal is very narrow, so that the steam-boat navigated it with difficulty. This river, however, is the Black or Gharat, which runs four miles an hour, and the lowness of the banks, which never rise above the level of the adjacent country, and are frequently lower, appear to prove that this part of the Sablawiyah is a portion of a running stream not a canal. Near the Euphrates the banks are thickly dotted with bushes of liquorice, which grow to the height of ten feet, and have roots of considerable thickness; these roots give consistence to the soft soil of which the banks are composed. Further on the country adjacent to the canal presents a boundless prairie, over which nothing of cultivation can be raised. In the rear, however, are the black tents of the nomadic Arabs. By this canal the wicker-boats of Hilt bring the produce of the country contiguous to that place to Bagdad, and it has twice been navigated by steamers. Before the Tigris it falls into a large lake called the Hor, which lies west of the town of Bagdad; a canal about five miles long called Mosaic, carries the waters of the Hor into the Tigris. It is also navigable for steamers.
Mesopotamia is also called the canal of Yusuf (Joseph). It begins about half an hour above Diwaniyeh and terminates at Gharah. The supply of water extends for seventy places wide, and its course lies nearly parallel to the Euphrates, at a distance of about 2 or 3 miles from its northern branch. The canal of the Arabian side is called the canal of Old Lamlun. It begins at the town of Alash, 72 miles beyond Diwaniyeh, and rejoins it a short distance above the mouth of the Yusuf canal. The two canals are connected with the Euphrates by numerous other canals of smaller dimensions, and others by a number of irrigation canals from the parts of the marshes which are more distant from the river. The numerous population derive their subsistence from their fields of rice, which extend over all the higher grounds, which are dry in summer, from their herds of buffaloes, and from the abundant pasture in the marshy tracts, and from their plantations of dates, which cover the banks of the numerous canals. They also have a few plantations of fig-trees. During the inundations the whole surface of these marshes is under water, with the exception of those places which are enclosed by embankments, and some more elevated tracts on which the villages are built. The villages also are frequently inundated, and when this happens, the inhabitants convert the roofs of their reed-built huts into boats, or place their families on buffaloes, and in this way reach a more elevated spot. It is very difficult to enter their country with any force, they are never ravaged by the paya or squirel of the region, the Fasha of Bagdad. The Euphrates in their country contracts very much in width, so as to be at some places not 200 feet across, and the Kasheel Araby levies a very arbitrary toll on vessels which navigate between the lower and middle course of the river.

The marshy tracts terminate at Grahim Inlet, and with them the large canals for irrigation: farther downward only small narrow cuts are met with, which serve to irrigate the tracts adjacent to the banks of the river, and do not advance far inland. The banks are more elevated, though not high, and in most places overgrown with bushes. This country is inhabited by the Montal Arabis, who form a mixed race of cultivation and pastoral occupation: the inhabitants have begun to cultivate the ground, but they have not quite got rid of the habits of a nomadic life. The country is covered with villages and tents mixed together. As the country is rather fertile, it is well inhabited, but not so populous as the marshes of Lamlun. The date plantations are as numerous and extensive as at any place higher up the river, but less care is bestowed upon them and on the cultivation of rice and wheat.

Those inhabitants who still adhere to a nomadic life have large herds and flocks of horses, camels, buffaloes, sheep, and goats. The tract of ground between the mouth of the two canals Shah of Kar and Shah of Elhy is swampy and half wooded, but little inhabited. But below the last-mentioned watercourse the country rather improves; the banks of the river present almost a continuous forest of date-trees, between which are found small lakes that are connected almost one another: on approaching the place where the two rivers unite, the banks of the rivers sink lower, and large tracts are seen, which in many extensive fields still occur, on which wheat, rice, and barley are grown. The uncultivated fields are used as pastures for the numerous herds of buffaloes. From ten to twelve miles from the confluence of the rivers, the waters of the Tigris are so abundant that the country is converted into a swamp, which during part of the year is covered with water many feet deep, and in the dry season it is cut up by numerous watercourses. This district is nearly uninhabited.

The Euphrates fertilizes the long country which extends on both its banks below the town of Diwaniyeh, as the Nile does the Delta of Egypt, but in a different way. The healthy climate, the richness of the soil, and the heat of which is similar to that of Egypt, as much as to the fertility of Egypt as the moisture with which its soil is saturated during the inundations. The fertilizing power of this sediment is ascribed by Ruppe to the hot sand blown from the deserts of the region, especially from the mountains of Abyssinia in a volcanic region of great extent. The Euphrates does not pass through such a region, and the detritus which it brings down is formed by the abrasion of the bed of the river and by the action of the weather on the clay. This soil is not fertile itself, but becomes so when irrigated. This advantage is partly obtained by the inundations, and partly by machines of different descriptions, or by hand, when necessary. The area, extending from the first of November to the end of the year. It then begins to rise slowly, and continues to rise to the middle of January. This rise is probably contributed to the great quantity of rain which falls in the second, third, and fourth months from 15 to 18 feet. Were this great volume of water permitted to rush down on the low country, it would entirely submerge it, and convert it into an immense swamp. To prevent this great volume of water from overflowing the country, and from Rioting the inhabitants, and from injuring the crops and fields, the regulating is done with a great deal of care. The farmers usually order the first collection of waters to be a little sunken, so as to receive the movement of the Euphrates, and to prevent any great accumulation or overflow. The reeds and rushes which are found on the banks of the river, and which are used for building purposes, are of great service in this respect, and are not allowed to be beaten down. The quantity of water is regulated so as to fill the channels of the smaller canals, which are used for irrigation, and to prevent any great accumulation of water. It is regulated also by means of the dikes which are usually constructed by the farmers, and which are called by the name of Shat El-Esha. These dikes are usually constructed of reeds and rushes, and are usually ordered to be about 15 feet high, and 15 feet wide. They are usually constructed at the time of the first collection of water, and are usually ordered to be kept in good order, that the water may pass through them without obstruction.
Mesopotamia is inhabited by nations of different origin. Owing to its position between two table-lands inhabited by nomadic nations it has been frequently beset by its neighbours, and it appears that they have expelled the original population, for the greater part of the country is inhabited by people whose ancestors have settled there within the period of recorded history. Those nations who claim to be aboriginal are the Armenians and the Yezidis. The Armenians are dispersed over the table-land of the Frat and Murad, and the HilIy Region of Mesopotamia. The first-named region is part of the Frat and the second of the Murad. It appears that until lately these three nations were almost equal in numbers in that country, but since the last war between the Turks and Russians many Armenians have left their country and gone to settle in Georgia. In the HilIy Region of Mesopotamia the number of Armenians is small in comparison with the Turks and Kurds. They are an industrious people, who occupy themselves with agriculture, the mechanical arts, and especially with commerce, by means of which they acquire wealth, and get into favour with the ruling nation, the Turks. They are Christians of the Greek Church.

The Yezidis are a small nation, who exclusively inhabit the Sinjar hills, and also isolated tracts in the eastern districts of the hilIy region of Mesopotamia and in Kurdistan. Though they are said to be descendants of the ancient inhabitants of Moawiyah, the destroyer of the race of Ali, they are evidently different from the other nations of the country. They are of a muddling size, and have a clear complexion, with regular features and dark eyes and hair. They are keen, active, muscular, and well proportioned. The hair is long wound and the beard and whiskers kept close shorn, but they are prohibited from cutting or dressing the mustachios. Their religion is a strange mixture of the practices of the Arabs and the Magi. They celebrate the festival of Madru under the name of the Yezidis in the sun as symbolic of Jesus Christ. They have no fixed place for prayer or worship, but occasionally visit the Christian churches and monasteries, and present offerings there on recovery from sickness or escape from danger. They are brave, hospitable, and sober, faithful to their promise, and much attached to their native soil, but cruel and vindictive: they consider their proper means of support to be robbery and theft, and they treat with great barbarity any unfortunate Mohammedans who fall into their power, especially Persians. They are industrious in cultivating the soil and managing their orchards and plantations.

The Kurds are a people who are partly considered as an original people. It is probable that when the Armenians generally adopted agriculture, those parts of their country which are unfit for cultivation, owing to the rigour of the climate, remained or became uncultivated. The possession of these tracts spread over these mountains from their own country. Where such tracts unfit for cultivation are extensive, the Kurds have adhered to their nomadic life, and are almost independent of the ruling nation. Where however agricultural and pastoral tracts of country are intermixed, they have partly acquired the habits of cultivators of the ground, but they still maintain an inclination to a roving life and to predatory excursions. They take great care of their cattle and sheep.

The inhabitants of Turkish origin are numerous in the table-land of the Frat and Murad, and in the HilIy Region of Mesopotamia, but they are thinly settled in the two southern regions. They doubtless settled in these countries at the different periods when Mesopotamia was conquered by the nations who inhabit the table-land of Iran, where the original inhabitants had been driven to the north. In Mesopotamia they are agriculturists, and carry on different trades in towns and villages. It does not appear that any of the Turkish tribes in Mesopotamia still adhere to a nomadic life, as is the case in carrying on trade. The Ottomans are only soldiers or employed by government as civil officers.

As northern Mesopotamia has derived a considerable part of its present population from the table-land of Iran, the southern regions, with the exception of a comparatively small portion, are occupied by tribes which have descended from the table-land of Nejd in Arabia; and this immigration, as it

Bedouin of Baghdad, which is not supplied with provisions from the lands in its vicinity, but from that part of Kurdistan which lies farther north. Baghdad is indeed surrounded with extensive gardens and some fields, but they extend only a few miles from the walls, and are surrounded by a uncultivated district. North of the town the plain is traversed by the great canal called the Ishabi, which extends from the neighbourhood of Tekrit to the Sakifawiya canal, but is without water. There are also many other canals of smaller dimensions in the same valley. The Shat El Arab probably contains a very small quantity of water all the year round, and in its vicinity are a few large villages, surrounded by orchards and plantations. The remainder of this tract is pasture-ground for the herd of the shepherds. North of Baghdad there is still less cultivation. The country is quite flat, and in most parts a grassy prairie, well watered; in others, covered with extensive swamps. A few small cultivated spots appear at great intervals. Herds of buffaloes however, and the black tents of the nomadic Arabians, are common. There are hardly two or three villages which have a permanent population. As we approach the confluence of the Tigris and Euphrates, nothing is seen but stagnant water, swamps, and morasses, in which single families have settled, who live on the milk of their buffaloes and the little rice that they can obtain.

The interior of the Plain of Babylonia is very imperfectly known. It appears to be considerably elevated above the tract adjacent to the rivers. The northern part, or that which lies between the Euphrates and the Shat El Arab, is a low undulating surface. The soil is composed of sand and pebbles, and in most parts overgrown with coarse grass, mimosa, and thistles. The water is generally brackish. Between the low sandy table-land and the higher parts there is an expanse of flat land, where the water is more abundant, which appears to be covered with a considerable space. In many parts efflorescences of nitrates and other salts occur, which in some places form nearly a white crust on the ground. On the banks of some of these efflorescences, and sometimes in the middle of the flat land, are a number of springs, which appear to cover a considerable tract. They form such masses that in the level country they are frequently taken for natural hills, until a closer examination shows that they contain a number of pieces of earth, stones, and bricks, like those found in the ruins of Baghdad itself. In some of these fragments of columns have been found.

With respect to the climate of this region the reader is referred to Baghdad [P. C., vol. iii., p. 272], the remarks in which article may in some measure be applied to the whole region. Its productions areenumerated in the Pashalik of Baghdad [P. C., vol. iii., p. 296]. Besides the town of Baghdad, a few places occur on the banks of the Euphrates which require notice. Hillah is a fortified place with about 25,000 inhabitants, Arabs, Persians, Turks, Jews, Armenians, and Indians, in the midst of a number of villages, and is also filled with mosques, It carries on a considerable commerce with all the towns on the Euphrates, mostly in river-barges of 50 to 80 tons. The imports consist especially of rice, dates, fish, oil, coffee, continuation of a number of pieces of earth, stones, and bricks, like those found in the ruins of Baghdad itself. In some of these fragments of columns have been found. Hillah is a fortified place with about 25,000 inhabitants, Arabs, Persians, Turks, Jews, Armenians, and Indians, in the midst of a number of villages, and is also filled with mosques, It carries on a considerable commerce with all the towns on the Euphrates, mostly in river-barges of 50 to 80 tons. The imports consist especially of rice, dates, fish, oil, coffee, continuar
would appear, is from time to time renewed. Many of these Arab tribes have changed their mode of life, which appears away to have been the case when the migrating tribes were not powerful enough to occupy large tracts of pastoral ground, and they directed their efforts for cultivated lands where they settled and became cultivators. There is a consider­able number of small Arabic tribes in the desert plains of Mesopotamia, and they always cultivate only a small tract of ground. The more powerful tribes took possession of extensive regions, and even where the country was fit for cultivation, they converted it into pasture-grounds for their horses, camels, and sheep. Some of them have preserved their nomadic habits to the present time; they are especially the case with the powerful tribe of the Shammar, which is in possession of the countries adjacent to the Tigris river from Mosul to Bagdad and nearly of the whole of the Great Desert. It is only in the vicinity of the Euphrates that a portion of an equally powerful tribe, the Aneizah, is found, but the principal seat of the last-named tribe is in the desert which extends from the Euphrates to Damascus. The cultivable tracts of the desert are in possession of some smaller Arab tribes, who are tributary to the Shammar. Other Arab tribes have been compelled by the physical nature of the country occupied by them to change their mode of life. This is most conspicuously the case with the Bedouin of Kasandal, which inhabits the marshes of Lamian. This region does not afford pasture for camels, horses, or sheep; it is, however, fit for buffaloes, for the cul­tivation of rice, and plantations of date-trees. The inhabitants of this district have been compelled to adopt the habits of the occupiers of swamps, but they have preserved their activity and their spirit of independence. The numerous tribe of the Moutefik occupies the long banks of the Tigris the whole compass of it, and the Kerna in the Barbourah, a tract which extends from the marshes of Lamian to the confluence of the two rivers. At the back of the marshes some smaller tribes are settled. That portion of the tribe of Moutefik which has settled on the Tigris has almost entirely on the produce of their herds of buffaloes, cultivating occasion­ally a small spot of rice-ground. On the Euphrates the habits of the Moutefik are much more agricultural: the date-plant­ations are their chief business, and constitute their principal wealth, but their richer classes have not yet entirely got rid of their nomadic inclinations, as they still prefer to pass their time with their herds of horses and sheep in the interior of the country, whilst the poorer portion of them cultivate their rice-fields and manage the date-plantations. Travellers however observe that both the fields and plantations do not exhibit that careful cul­tivation which is observed in other parts of Asia where the habits of the people are entirely agricultural.

It would be an almost endless task to enumerate all the political changes to which Mesopotamia has been subject since being was named in history as the birth-place of Abraham. There is much space in the course of the globe there have been so frequent and so great. From the sway of the kings of Babylonia Mesopotamia passed successively to that of the Assyrians and Medians, and then it was subdued by the command of Cyaxares, and from this time there were two powers in the country, the Greeks and the Persians. After the battle of Issus it fell into the power of the Macedonians, and after the death of Alexander his generals Antigonus and Seleucus successively possessed of it. Seleucus founded the kingdom of Syria, of which Mesopotamia formed a portion, until the countries belonging to the Persian kingdom were divided between the Romans and Parthians. During many centuries Mesopotamia was the theatre of the wars in which these two nations contented for superiority until the Parthians were supplanted by the Persian dynasty of the Sassanids, when Mesopotamia was dismembered between them and the Greek em­pire of Antioch. But at last the Persians appeared, and their caliphate established the seat of the wide-spreading empire in Mesopotamia. Since the destruction of the king­dom of Babylonia, the country had not enjoyed so much pros­perity as under the Persians; but after the Medes and prcises had lost their power, Mesopotamia fell into the hands of the Turkish princes, the Sejukas and Atebeaks. About the beginning of the twelfth century a portion of it was conquered by the Crusaders, but the power of this country did not keep them, and the country had been laid waste by the continual wars of the Mo­hammedan princes, it was invaded by the Mongols, who however soon left it, and then Mesopotamia again returned to its original condition, but after the Crusaders had left the country, the Musulmen renewed their conquests over this part of Asia. Their progress was for a time interrupted by the famous Timur, but after his death the Osmanias again

acquired the ascendancy, and subdued the whole of Mesopo­tamia to their dominion in the beginning of the sixteenth century. Since that time no political change of importance has taken place.

(Keene, Travels in Ancient Babylonia; Fraser's Travels in Koordistan and Mesopotamia; Kinnee's Journey through Asia Minor, Armenia, and Koordistan; Buckingham's Travels in Mesopotamia; Rich's Narrative of a Journey to the Site of the Sumerian Empire; Keppe's Personal Narrative of Travels in Babylonia, Assyria, &c; Southcote's Narrative of a Tour through Armenia; Ainsworth's Travels and Researches in Assyria, &c.; Chenevix's Report on the Steam Navigation to India; &c.)

MESPLUS, a genus of plants belonging to the natural order Rosaceae, and to the sub-order Pomeae. [Pom­me, P. C. S.] It has the eulyx 5-cleft, the segments foliaceous, the petals nearly circular, the pome 6-celled, the styles 3-6, the fruits 2-5 glabrous; the pome turbinate, open, 5-celled; the endocarp bony. The species are trees, natives of Europe, and in a wild state are furnished with spines, which all disappear on cultivation. The flowers are large, nearly sessile, and white.

M. Germanica, the common Medlar, has lanceolate undivided leaves, downy beneath, and solitary flowers. This plant is a native of Europe and Siberia. It is found in Great Britain in hedges and thickets in Surrey, Sussex, and Cheshire. It is cultivated on account of its fruit, which is eaten in a state of decay. Its taste and flavour are peculiar, and greatly esteemed by some persons. De Candolle describes three wild varieties of this species of medlar. The following are the garden or cultivated varieties:—

1. Blake's large medlar.
2. The Cornish, a large Dutch, broad-leaved Dutch, or large German medlar. It bears the largest fruit of any of the cultivated medlars.
3. Stoneless or French medlar, has small oblate fruit, not much esteemed. It is the result of a very remarkable variety.
4. Notting-ham, common, small-fruited, or narrow-leaved Dutch medlar. It has an oblate middle-sized fruit, and is the best of all the medlars.

M. smithii, Smith's Medlar, has obtuse elliptic serrated leaves, pubescent on the nerves beneath, the flowers usually solitary. The native country of this plant is unknown, but it seems to have the characters of a true species. It has white flowers, which are one-half smaller than those of the common medlar. The stipules of the sterile branches are large and foliaceous.

The similar may be propagated by grafts or by layers, or by grafting upon seedling stocks of their own species or any kind of Pomacea. Forsyth remarks that the kinds of Mesplius do better by grafting on their own stocks. The soil best adapted to the plant is nearly sandy, and neither moist nor dry, but not on a moist bottom. It may be grown either as a standard or an espalier. The general horticultural treatment should be similar to that of the apple-tree. For a description of the pomaceous genera of Rosaceae, see POME­me, P. C. S.

(Don, Gardener's Dictionary; Babington, Manual of Brit­ish Botany; London, Arboratum et Fructicetum Brit.)

MESSENGERS AT ARMS are the officers who exe­cute the writs issuing from the supreme courts in Scotland. The duty of executing the king's writs and injunctions ap­
ears to have rested with the Lyon King at arms, aided by
the heralds or other assistants. To this day the Court of
the Lord Lyon has authority in the admission of messengers at
arms, in the impugnation of their conduct, and in their dis-
mission for the proper and legal performance of his official duties.
Messengers require to perform their functions with great pre-
cision, as they are not only amenable to questions regarding the
laws of arms, but to the law of arms as well. For the legal accuracy of
which the title to landed property may
afterwards depend.
METAMORPHOSIS, VEGETABLE. [VEGETABLES, METEOROLOGY, C. S.]
METEOROLOGY. [ELECTRICITY, ATMOSPHERIC, P. C. S.]
METOPTA, a genus of fossils (allied to Patella?), proposed by Professor Plutarch. From the mountain limestone
of the north of England.
METRORUS, a distinguished antient painter and
philosopher of Athens, born about two centuries before the
Christian era. After the defeat of Perseus by Paulus
Emilius, in Greece, n. 618. The Roman general ordered the
Athenians to send him their most able painter to per-
testate his triumph, and his most distinguished philosophers
to educate his sons. The Athenians said Metrorus the extra-
ordinary honour of declaring to Paulus Emilius that he was
both their greatest painter and their most distinguished phi-
losopher ; and the Roman general is said to have been per-
fected before the day appointed.
As Metrorus was chosen to paint the triumph of Paulus
Emilius, and to educate his sons, and gave him satisfaction in
both respects, we must infer there is a certain amount of
talent contained in the picture. It must have been
an undertaking of great magnitude, and indeed, if ade-
quately represented, a very extraordinary performance, for in
the procession of this triumph, which is partly described by
Plutarch, there were two hundred and fifty wagons con-
taining Greek works of art: the spectacle lasted the entire
day.
(Pliny, Hist. Nat. xxxiv, 40; Plutarch, Paulus Emilius,
32.)
METROPOLIS. [Colony, P. C., p. 366.]
METROPOLITAN. [ARCHBISHOP, P. C.]
METROPOLITAN STAGE-CARRIAGE. Before pro-
ceeding to give a brief notice of the law relating to hackney
and stage carriages in London, we may quote, from two inter-
esting papers on the 'Vehicular Statistics of London,' in
'Chambers's Edinburgh Journal' for 1845 (Nos. 76 and 78,
New Series), some statements relative to such of the public
vehicles of the metropolis as are not embrace in the article
HACKNEY-COACH, P. C. S. These papers, we may observe,
are the more reliable, because they have
The distinction between hackney and stage carriages is
pointed out under HACKNEY-COACH; and the origin of
that class of stage-carriges, which has almost entirely superseded the
chaise landau, is in the London, not in the
omnibus, P. C., p. 437. 'Fifteen years ago,' observes
the writer of the papers above referred to, writing in 1845,
'a few very slow and uncapital stages were the only means
of transit provided for the citizens to convey them to their
suburban residences.' 'A little earlier,' he adds, 'only one
stage plied from Paddington to the Bank, along a road which
an omnibus now passes every three minutes in the day;
and this single vehicle, going in the morning and returning at
night, was not always full. Its fares were two shillings in-
side, and eighteen-pence outside.' The old stage-coaches
could only carry four, or at most six, inside passengers; and when the number of passengers about the year 1800, to introduce
a more commodious kind of vehicle, resembling an omnibus,
the project failed, in consequence of a general prejudice against the horse-like appearance of the carriage. The long-
ness of the carriage was the chief object of dissatisfaction,
and six wheels (Knight's 'London,' vol. i. p. 32.) When re-
introduced from Paris, the omnibus had four wheels, but was
much longer and heavier than at present, and was drawn by
horses harnessed abreast. About the year 1830, to introduce
omnibus as being the best mode of applying the power of the
horses in drawing, was soon abandoned, it being found that
the middle horse was distressed and injured in a carriage
on each side. The first successful omnibus in London was started by a coach-builder named
Shillibeer, in July, 1839, to run between Greenwich
and Charing-Cross, at fares considerably less than those of the
old short stages; in addition to which advantage, the greater part of the passengers were sheltered from the weather.
By the judicious arrangement of making the same charge for
inside and outside places, Shillibeer soon obtained extensive
patronage, and by the development of the omnibus system, the
clausiveness which formerly distinguished inside from outside
passengers. Success in the first experiment led Shillibeer
to establish omnibuses between Paddington and the Bank.
In the omnibus, not vice versa, as it was so much regretted that the person to whose enterprise London is indebted for
so great a boon, though thus prevented from reaping
his reward, should never, so far as the writer is aware, have received a testimonial for his important services.
In the course of the contest between Shillibeer and the
old proprietors, and of the subsequent quarrels and rivalries
among themselves, the omnibus system fell into disgrace in
consequence of the furious driving, want of punctuality,
and general ruffiandy conduct of the men employed as drivers and
conductors, or, as they were popularly called, 'cads.' These
evil led to the establishment, in 1836, of a joint-stock associa-
tion called the London Omnibus Company, which
posed to establish omnibuses along the principal lines of
traffic, starting at short and regular intervals, and conducted by men of sober and respectable character, who were strictly
forbidden to ride faster than a walking pace. The result
of this experiment was so successful, that on the lines
which yet remained in private hands the proprietors found it to be
necessary to follow their competitor, and the whole system
itself into associations of similar character. In the course of
a few years the association system was almost universally adopted,
and now, while on many lines of road the omnibuses belong
to several different individuals, there is hardly an instance
in which these individuals are not united in some compact which
prevents competition, and secures community of interest
among all the carriages running the same road, or rather among all running to and from the same termini. On the
Paddington road, after a competition for some time between
the London Conveyance Company and the association formed
by the old proprietors, the two bodies united to 'work the
roads' for their mutual advantage. Paddington is the sub-
urban terminus of two very important lines of road, each of
which has also a common City terminus at the Bank of
England. One of these lines follows the course of the City
Road and New Road, by Islington, Hoxton, and the
northern suburbs of London; while the other takes a more
direct course through the heart of the metropolis, by Holborn
and Oxford Street. For working the last-mentioned line the
London Conveyance Company have, some years ago, referred to at the commencement of this article, eighty-two omnibuses,
and not less than a thousand horses Each of the
omnibuses performs, upon an average, six journeys (that is,
from morning to night, and, therefore, eight,) by two or
three horses to work it, independent of casualties. These
horses are selected for strength and activity, and an experienced veterinary surgeon, with a staff of assistants and farriers,
besides upwards of eighty horse-keepers or grooms, are em-
ploved to attend to them. These are independent of eighty-
two drivers, and as many conductors, so that nearly three
hundred persons are employed by the Company, for the service
of this one line of road. The journeys are performed at in-
tervals of from one and a half to three minutes, according to
the time of day; and as each omnibus makes six double jour-
nies, of about nine miles each, the total number of journeys
run daily is 492. At the number of miles driven is about
4428. 'Supposing,' observes our authority, 'we take as an
average ten passengers for each trip, the gross receipts of
the London Conveyance Company must, if that guess be an
approximation to the true facts, amount to £573 per day, or
89,700. per year.' These statements may serve to convey
some idea of the great extent of the omnibus traffic of Lon-
don, and of the number of persons dependent upon it; especi-
ally when it is remembered that the working of the horses which they refer constitute the working stock of only one
single route. The total number of omnibuses running to
and from the City of London is said to be nearly 200. The total number of stage-coach passengers running
and from London during the year ending January 4, 1845,
according to information obtained from the licensing office,
was 1472, of which it is calculated that at least 1400 were
ometuses. By a rough calculation, the writer to whom we are indebted for the collection of the facts, computes that about 2000, are spent daily in omnibus fares, making a total of 720,000l. per annum. The number of licensed drivers in May, 1844, was 1740, and of licensed conductors, 1859, but 300 took out licenses in both capacities, and are therefore counted twice. By adding these numbers to those quoted under HACKNEY-Coach, our authority computes (without, we may observe, deducting the 300 cases of licensing) that 8000 individuals were, in 1844, licensed as drivers and conductors of, or 'watermen' to attend to, the various public carriages used in the metropolis; that in all 3922 vehicles were in use, and that 'the census and course' of all the metropolitan hired carriages exceeds 1,500,000.' It is gratifying, as an evidence of the improving character of the class of men employed, to find that the above large number only forty-two were refused new licences on account of misconduct.

The length of journey run varies from about four up to twelve or thirteen miles; but by far the greater part of the London omnibuses run a total distance, from end to end of their journey, of less than eight miles. With such a usual charge is fivepence per passenger, whether for the whole or a part of the journey; but a very large portion of their receipts are from 'short' passengers, or such as are picked up and set down along the way. Omnibus proprietors are much exposed to peculation on the part of their servants, and various mechanical contrivances called 'tall-tales' have been tried to protect their interests by registering the number of passengers carried. They have continued in use; but it is in connection with the association system a method of checking the conductors, by a kind of secret police, has been adopted. When it is found that the returns made by one conductor fall short of the expected sum, spies are sent out who have continued in use; but it is systematic is this service performed, that any attempt at deception is sure to be detected, and followed by suspension or dismissal.

The power of applying such a check is one of the many advantages of the association system, in which, as commonly worked, each individual proprietor contributes a certain number of turn-out (a turn-out being the technical name for an omnibus with its complement of horses and men) to a common stock, which is worked, so far as regards the time of starting, speed, and other regulations, for the common benefit. The receipts of each omnibus are then paid into a common fund, from which each proprietor receives a portion proportionate to the number of turn-outs contributed and maintained, without regard to the actual receipts of the omnibus owned, by him.

The laws which relate to hackney-carriages and Metropolitan stage-carriages are chiefly comprised in two acts of Parliament, viz.: the 17 Geo. IV. c. 92, the 'Metropolitan Omnibus and Stage Carriages Act in the reign of William IV. in the year 1834,' entitled 'An Act to amend the Laws relating to Hackney-Carriages, and to Wagons, Carts, and Drays, and to place the Collection of the Duties on Hackney-Carriages and Post-Chaises and Post-Coach Horses under the Prosecution of the Commissioners of Stamps,' and G & 6 Vict. c. 86, (22nd August, 1843), entitled 'An Act for regulating Hackney and Stage Carriages in and near London.' In the former act are contained the greater part of the enactments which relate to hackney-carriages; in the latter, those which more especially apply to Metropolitan stage-carriages (omnibuses).

The limits of hackney-carriages (hackney-coaches and cabriolets) are five miles from the General Post-office, London; and drivers of hackney-carriages are comparable to drive five miles from the place where hired or from the General Post-office. Hackney-carriages shall be discharged at any place beyond the limits of the metropolis (that is, beyond a circle of which the radius is three miles from the General Post-office), after eight in the evening and before five in the morning, and may be driven by a man nearest station or in the said limits or to any standing-place beyond the limits where the carriage may have been hired, at the option of the hirer.

The fares of hackney-carriages are fixed by the act 1 & 2 Wm. IV. c. 42. For every hackney-carriage drawn by two horses, for any distance not exceeding one mile, 1s.; for any distance exceeding one mile, at the rate of 6d. for every half-mile, and 4d. for every quarter of a mile. The maximum number of any half-mile completed. By the time, the fare, is for not exceeding thirty minutes, 1s.; not exceeding forty-five minutes, 1s. 6d.; not exceeding one hour, 2s.; and for any further time at the rate of 4d. for every fifteen minutes completed, and 6d. for any fractional part of fifteen minutes. The fares for hackney-carriages drawn by one horse (cabriolets) are one-third less, so that for the first mile they are 5s., for a mile and a half 6s., for an hour 9s., and so on. Any hackney-carriage is licensed for any one of these purposes, and also for any one of the others.

Every hackney-carriage and Metropolitan stage-carriage is licensed by a registrar, deputy-registrar, or other officer appointed by one of His Majesty's principal Secretaries of State; and every person who drives or conducts a hackney-carriage or a conductor of a metropolitan stage-carriage, and every waterman, at the time of granting the licence receives a metal ticket, which every such driver, conductor, or waterman is bound to wear or cause to be worn by him, and which may be distinctly visible. Watermen are the assistants of drivers of hackney-carriages and of Metropolitan stage-carriages stationed at certain places to supply the horses with water, &c., and they also receive a licence. A stamp duty of 6s. is charged on every licence, and 10s. a week during the continuance of it. Plates are to be affixed to hackney-carriages with the name and abode of the proprietor and number of the licence; and 'Metropolitan Stage-carriage,' or such other words as the registrar shall direct, are to be painted on omnibuses. Proprietors of metropolitan stage-carriages fix their own fares, but those fares are to be distinctly painted on or in the omnibus, as well as the number of persons for whom the carriage is licensed.

Hackney-carriages standing in the street, though not on any stand, to be deemed plying for hire. Drivers may ply on Sundays, and in the two days in the week preceding a Bank Holiday, for the purpose a driver to watch him by taking their places as passengers, and reporting at headquarters the numbers taken up, as a check upon them; and so systematically is this service performed, that any attempt at deception is sure to be detected, and followed by suspension or dismissal.

The act 6 & 7 Vict. c. 86, repeals a previous act (1 & 2 Vict. c. 79), and extends the enactments not specifically repealed of the 13 & 14 Wm. IV. c. 22, to the 6 & 7 Vict. c. 86. Other provisions of the acts relate chiefly to the restoration of property left in carriages, to furiously driving, intoxication, insulting language, loitering, and other acts of misbehaviour; to proceedings of proprietors, drivers, and conductors, as to licences, payments of duties, contracts with each other; and to modes of granting summons, powers of magistrates, punishments, &c.

METROSIDEROS (from μπρός, the heart of a tree, and σιδήρος, iron), a genus of plants belonging to the natural order Myrtaceae. It is distinguished from allied genera by the tube of the calyx not being angular, adhering to the ovary, the limb 6-lobed; the stamens 20-30, free, very long, and exserted; the style filiform, and stigma simple; the capsule 2- or 3-celled, the cells many-seeded; the seeds wingless.

The species are native to Madagascar, and a species is found growing near Sydney, in New South Wales.

M. vera, true Iron-wood, has opposite ovate-lanceolate acuminate quite glabrous leaves seated on short pedicles; the cymes axillary, pedunculate, many-flowered. It is a native of Java and Amboyna, among rocks. The Chinese and Japanese value the wood of this tree, which they apply to many purposes, as the making of rudders, anchors, &c. for their ships and boats. The bark is used in Japan as a remedy in mucous discharges, diarrhoea, and dysentery. It is usually mixed with some aromatic, as parings, cloves, or nutmeg.

M. polymorpha has opposite coriaceous leaves, of various forms, glabrous on both surfaces, but covered with a little silky tomentum on the lower; the flowers are perfect, in terminal and axillary, corymbose; the calyxes and bractlets glabrous or clothed with silky tomentum. This species is a tree, and grows in the Sandwich Islands, and is said to be the plant from which the clubs of the native people are made and employed in warfare by the South Sea Islanders. The Aki or Limgun Vite of New Zealand, the Rata and the Pohutukawa of the same country, are all allied, the seeds trees belonging to these species. (Lindley.)

Several other species of Metrosideros have been described, natives of New Holland and the South Sea Islands. M. incisa, a beautiful shrub, is found growing on the South Island of New Zealand, and is called the 'Alpine Labrador. As far as the Islands, it is in 50° south. The M. burzillii of Allan Cunningham is the New Zealand plant called Ahu, and is a rambling shrub, adhering to trees, and climbing by means of its lateral
root to the summits of the loftiest trees in the forests of Wanganaroa and the Bay of Islands. In cultivation these plants may be grown in a mixture of loam, peat, and sand. They consist of thirty-three pictures and the following cutting. Hips cuttings will root in sand under a hand-glass.

(Don, Gardener's Dictionary; Lindley, Vegetable Kingdom: Barnett, Outlines of Botany.)

MEYER, GABRIEL, one of the most celebrated of the German engravers of Bonn, where he was born in 1755. He studied under Bartolozzi, in London, and remained altogether about twenty years in England. He published in 1790 a set of thirty-three engravings, including the title, after Goethe the Third's collection of drawings by Parmeggiano; and in 1791 a set of sixty-three plates in a similar style, after the designs by Polidoro da Caravaggio, in the possession of Sir A. Hume, He published a great number of imitations of old masters. In 1801 Metz went to Rome, and commenced a series of engravings after the Last Judgment in the Sistine Chapel, by Michael Angelo. It is engraved in chalk manner in Silesian separate sheets, with an outline of the whole. Metz died at Rome in 1827, aged seventy-two. Dr. Nagler enumerates upwards of two hundred of his engravings in his Künstler-Lexicon.

MEZI, GABRIEL, one of the most celebrated of the Dutch painters, was born at Leyden in 1616. It is not known under what master he studied, but he obtained a great reputation at Amsterdam while still young. Like Mierts and Terburg, Mezi painted landscapes, and was particularly noted for his pictures painted what are called conversation pieces; and often a lady at her toilet, or in her boudoir, with all the usual accessories; his scenes are occasionally taken from humble life, but generally represent the higher classes of the community. He excelled in light and shade, drawing, and colour, and his execution is always extremely careful: his pictures, though very small, are always finished with the minutest attention to detail. Metz perhaps attained perfection in his style, and can be counted among those few inferior artists of the 17th century who can claim to have raised the not inconsiderable art to its highest degree of excellence: the tone of his pictures is complete nature, every tint is perfectly true, and every object is accordingly in its proper place, for his drawings and his line, perspective was equal to his light and shade, and colour. Beyond this he did not go; his works exhibit nothing choice or extraordinary either in subject or arrangement; and the faithful representation of familiar life appears to have been the end of his art, not for the sake of the scenes, but for the imitation of his. He was essentially a materialist in art, and this is the distinguishing characteristic of the Dutch painters generally. He painted a few portraits; there is one of Admiral van Tromp in the Louvre. Some of his works realize very high prices; many of them have been engraved. Mezi died, according to D'Arsenville, in 1688, in consequence of undergoing an operation for the stone: thus it appears that Mezi died in Munich, the city of his birth, by him, dated 1682; the date therefore of his death is uncertain.

MEUM (from miurus, smaller), a genus of plants belonging to the family of the labiatae. It is a small genus of about a dozen species, which are all prostrate herbs, with small white flowers, and small teeth. It has an oblong calyx; entire elliptical petals, acute at both ends, with an incurved point; the fruit elliptical, terete, or slightly dorally compressed; the carpels with five sharp somewhat winged ridges; the stamens and cumminae with many veins. There are two species of this genus.

M. Aethamasticon, Common Bald-Money, has bipinnate leaves with multipartite leaflets, the segments thread-shape, acute. This is a highly aromatic plant, with numerous white and yellow flowers. It is a native of Europe, in dry mountain pastures, and is found in England and the mountains of Scotland. The roots, seeds, and every part of the plant are aromatic. It contains a number of volatile oils, and, as stomachics and carminatives. This and the other species, M. Mutellina, the Swiss Bald-Money, which is a native of the subalpine pastures of Europe, enters into the composition of the compound called Venemie treacle.

(Rhabdina, Manual of British Botany; Lindley, Vegetable Kingdom.)

MEYER, HENRICH, a German designer and painter, and a son of the above, was born in 1787. He is known as Goethe-Meyer, from his close intimacy with the great writer. For forty years Meyer was Goethe's consulting and confirming oracle in all opinions on art, and was every day at his side in the critical parts of Goethe's publications on art, as Kunst und Alterth., 'Winkelmann und sein Jahrhundert,' Propylachsen, &c.

P. C. S., No. 123.
deep gorges in their sides and frequently cause landslips. The lower part of this tract contains numerous vineyards, orchards, and orange plantations. Between the two largest places of the island, Ponte Delgada and the southern town of and Ribeira Grande, on the northern, lies the lowest part of the whole. The shores are here low, and rise almost imperceptibly towards the interior, where an irregular line of hills and craters, beginning on the east, with the Fico do Fogo, 1031 feet above the sea, and terminating on the west with the Sierra Gorda, 1574 feet. The soil of this tract is in general very fertile, but there are extensive plantations of vines and vitreous lava, which are only fit for vineyards. There are no hot springs or other signs of subterranean heat, and the whole of this district is deficient in water, in consequence of its inferiority. The most western part of St. Michael’s appears to have been more subject to volcanic changes than any other. It contains in its centre a valley of an elliptical form, called the Sete Citades, which is three miles long from south-east to north-west, and two miles and a half broad from south-west to north-east. The ridge which bounds it is of nearly equal height throughout, except where it runs into peaks. On the south-east is a short chain, two miles long, terminating in the Pico de Carvoa, which is 2652 feet above the sea. The greater part of the interior of this valley is occupied by two lakes. In this tract are two hot springs which rise up in the sea below high-water mark. The soil varies much in character, being in some parts a yellow argillaceous earth, well suited for cultivation and of great fertility, in others a mixture of pumice and scoria, or a vitreous intractable lava which defies the efforts of even the most assiduous agriculturist. Hot springs are frequent, except in the eastern districts and the country between Delgada and Ribeira Grande.

Although the climate is variable both as to heat and humidity, it is generally temperate, and the climate does not materially affect health or comfort. In summer, the sun generally glistens in the atmosphere and mitigates the heat; in winter, there are few days when heat is not felt, and during the whole year there is only one day in which agricultural labour may not be carried on.

### Table of the Temperature of Air

<table>
<thead>
<tr>
<th>Month</th>
<th>Minim.</th>
<th>Mean. Daily Ranges</th>
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<tbody>
<tr>
<td>October</td>
<td>75°</td>
<td>58°</td>
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<tr>
<td>November</td>
<td>61°</td>
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<td>December</td>
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<tr>
<td>September</td>
<td>78°</td>
<td>64°</td>
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</table>

The mean temperature in winter is 62° and in summer 69°.

The extremes of the whole year are 46° and 64°, in winter 46° and 76°, and in summer 65° and 84°. In February 46° and 72°, and in August 65° and 84°. A much greater proportion of vapour exists in the air in all seasons than in England. The mean annual quantity of rain is 30 inches near the level of the sea, and the maximum 42 inches, while it is probably not less than 60 inches on the mountains. The prevailing winds are from the north-east and north-west. Northerly and easterly winds prevail over those from other points of the compass in the ratio of 57 to 26, which indicates that the island is not situated in the part of the Atlantic where westerly winds generally prevail.

The principal occupation of the inhabitants is the cultivation of crops and the grazing of animals. The island contains 147,200 acres, of which 2100 is forest and 102,600 acres are occupied by mountains, lakes, rivers, roads, and dwellings. The grazing which is extensively cultivated, is especially in the west, Indian corn, and beans. Yams and bananas succeed in several places on the southern coast. Several kinds of vegetables are grown, but the common people cultivate only corn, potatoes, and tobacco to any extent. As two-thirds of the island are cultivated, the produce-grounds on the more rugged portions of the island are extensive. All the domestic animals of Southern Europe are kept, but the breeds are inferior. Of wild quadrupeds only rabbits, ferrets, and weasels are noticed, with rats and mice. There are many kinds of birds, mostly those of small size; fish is rather abundant along the shores.

The inhabitants, who are Portuguese, are an industrious people, but near the whole of them, amounting to 80,000 individuals, are employed in agricultural labour. With the exception of the common mechanical trades, the manufacturing industry is limited to some coarse woollen stuffs, especially rugged and coarse, a coarse kind of red pottery, which is made at Villa Franca.

The capital of the island, Ponte Delgada, is built on the southern shore. It has an unsafe harbour, for when the wind turns to the south all the vessels are compelled to slip their anchor, and they can only return after the wind has changed to another quarter. The town is surrounded by extensive grape plantations, and is rather a pleasant place, in which many English live. The population is upwards of 20,000, and it is the largest town in the Azores. Alagoa, farther east, has a small port and 4000 inhabitants; and Villa Franca, still farther east, 5000 inhabitants. In the vicinity of these places are extensive plantations of oranges. On the northern coast is the town of Ribeira "Grande, with 12,000 inhabitants. It has no harbour, being hewed in by rocks of rock, which run out some distance from the shore. It is irregularly built, the houses being scattered over rocky uneven ground, and forming narrow irregular streets along the coast. It has some manufactures of woollen stuffs.

The foreign commerce was formerly confined to Portugal, but at present the island is visited by English, American, and Brazilian vessels. The number of English vessels which anchor annually at St. Michael’s is usually 120, and the trade is frequent, except in the eastern districts and the country between Delgada and Ribeira Grande.

Although the climate is variable both as to heat and humidity, it is generally temperate, and the climate does not materially affect health or comfort. In summer, clouds generally float in the atmosphere and mitigate the sun’s heat; in winter, there are few days when heat is not felt, and during the whole year there is only one day in which agricultural labour may not be carried on.

The island was discovered in 1444 by Cabral, and was settled in the following year. Since that period it has remained in possession of the Portuguese.
picture, on which their names were inscribed. This circumstance is noticed by Pausanias, who remarks also that the best part of these paintings was Acacius and his horses. It is observable that all Micon's pictures were of such subjects as admitted the themes of horses, as the horse was not the best subject that could be chosen for the display of the painter's skill in painting these animals, as the battles of the Amazons and the Centaurs. Micon, as already mentioned, was the most celebrated of the Greek painters in his respect, yet he was not altogether perfect in his horses, for he gave some of them lashes to under their eyelids, which horses have not. His horses were objected to on this account by the scientific horse man and a critic, and who, according to Pliny, was the first writer on Equitation: a statue by a sculptor of the name of Demetrius was erected to Simon's memory at Athens. This nicety of criticism tends rather to establish Micon's reputation than otherwise, as this was the only error detected by so able a critic. According to another account, it was a fault that was found with some of the horses of Apelles. Great excellence however, in the drawing of the horse, is not at all inconsistent with the state of the art at the time that Micon lived, for we have actual remains of that very period in the beautiful horses of the frieze of the Parthenon, now in the British Museum, executed under the superintendence of Phidias, who was the uncle of Paniasus, with whom Micon worked in the Focce.

A figure in one of Micon's battles of a certain Bute was the origin of an Athenian proverb: Bute was painted conceitedly, and it compelled him to relinquish painting pictures, for it was his head and eyes, which seemed to the Athenians so very expeditious a method of painting a warrior, especially one it was necessary to give a name to, that 'Micon painted Bute's eyes out of place', which was the common saying of expressing anything that was quickly done. Varro speaks of the style of Micon as crude and unfinished when compared with the works of Apelles and later artists. This is very possible, and the same might be said of many of the works of Michelangelo and Raphael compared with those of almost any of the scholars of the Carracci; yet the difference is not one of execution, and is not at all essential, nor does it in the least interfere with the higher qualities of art, as form, expression, or composition.

Micon was also a sculptor: he executed, according to Pausanias, the statue of Callias, the Athenian pacificist, at Olympia. Micon appears to have been not an uncommon name among Greek artists. The father of Onastus of Aegina was Micon; and Pliny mentions Timarete, herself a painter, as the daughter of a painter of the name of Micon.

There was also a Syracusan sculptor of the name of Micon; he was the son of Nicestes, and made the two statues of Hiero II., which were placed by the sons of Hiero at Olympia.

MICROMETER. [Divided Eye-Glass Micrometer, P. S. C.]

Mierevelt, Michiel Janzen, a celebrated Dutch portrait painter, was born at Delft in 1607, not in 1668, as in the first edition of Van Mander. His father was a goldsmith. Mierevelt was a very precocious boy; at eight years of age he could write better than any schoolmaster in Delft; at twelve he could engrave, and at fourteen he was a good painter, having studied for about two years under Anthony Bloklandt at Utrecht.

Mierevelt painted almost exclusively portraits, and chiefly historical portraits of that celebrity, even beyond the limits of his own country, and he could not be persuaded to leave it. The Duke Albert of Nassau, in consideration of his abilities, granted him the privilege of carrying on his Meissonier worships, and then, and Charles I. of England invited him in 1625 to visit England, an invitation which Mierevelt declined because the plague was at that time in London. He died at Delft in 1644.

Mierevelt's portraits, though extremely numerous—Houbrecht compiles them at 5000—are generally well drawn and very elaborately finished. Many of them are engraved by various masters, and there are rare drolleries, which the great landscape painter, Jan Michiel, was of the same age but lived longer. He had two sons, who were likewise excellent portrait painters, Pieter Michiel and Jan Michiel; the elder was born in 1609, and died aged only twenty-eight in 1633: the younger also died young.

The following verses are under Mierevelt's portrait in the first edition of Van Mander, which was published during his lifetime:—

Penguendo su vivum, quo non presentior alter; Deum, qui non est tecum, tuae sunt virtutis.  
Principum magna fortitiae atque: is ipse  
Hic est, qui scelus et armas multae cuita.  

(Van Mander, Het Leen der Schilders, &c., ed. 1674;  
Houbrecht, Groote Schouburg der Nederlandsche Konstchilzens ed.)

MIGLIARA, Giovanni, a very distinguished modern Italian artist, who invested architectural painting with a species of interest which it had not before possessed even in the ablest hands. He was born at Nice on October 15th, 1785, of poor parents, who placed him with Luigi Zucolfi of Milan, to learn wood-engraving; but on discovering his strong and peculiar talent, Zucolfi sent him to study architecture and perspective, under Albertolli and Levati, at the academy of the Brera. So prepared, he next studied scenic painting under Galiari, and practised that branch of art—for which Milan was then celebrated beyond any other place in Europe—about eight years, 1809-10, sharing in the fame reaped by Galiari, Peregno, Landriani, and Sannquirzico. This eminently successful career, one moreover which he pursued with such devotedness, was all at once arrested by a long and dangerous illness, occasioned partly by over-exertion, and partly by a pulmonary attack in consequence of cold caught while working in a damp place. This perhaps eventually proved a great advantage both to himself and to art, inasmuch as it compelled him to relinquish painting, at least in the smaller scale, and led him to produce works that are now treasured up for admiration in galleries. At the time however his illness was a serious calamity, for his family were reduced to very great distress. Owing to some care and a portion of money he received, he was gradually recovered, and no sooner did he begin to do so, and was able to sit up in bed, than he employed himself in making pictures on a small scale of the various scenes—amounting to about a hundred—which he had painted for the theatre. Produced through necessity, as the only means of earning subsistence for himself and family, these subjects not only found purchasers, but there became even a demand for them. Thus encouraged he determined to undertake the decorating of scenic scenery 'in small,' and also to combine the dramatic with the scenic-painter, peopling his canvases not with mere figures as accessories, but with episodical groups of actors, either illustrating popular and local manners, or recording some historic incident; and among his numerous pieces of the latter class may be mentioned his Ileegonda, Adelaide dying in a souterain of the Trappists, the Condemnation of Pansa, the Duchess de la Vaillere, and Charles V. at a Convent. In depicting the personages and manners of familiar and everyday life, he displayed a vein of strong humour; and his converted to the uses of a popular poet, and his dialect poems, rendered him an especial favourite with the public. Independently of the figures and stories—the great attraction for the many with which he:bold his productions—he converted architectural painting into a more actual portraiture of buildings into real picture, by the united mastery of perspective, chiaroscuro, and colouring. His pictures give the impression and sentiment of the edifices themselves, and are stamped by illusion yet anything but prosaic reality. Such was the reputation he acquired, that not only the King of Sardinia bestowed upon him the Order of Merit, but his native city Alessandria struck a medal in honour of him, in 1829. Honoured and prosperous in his profession while only in the meridian of life, he might, not unreasonably, look forward for years of uninterrupted happiness, when he was carried off by an attack of fever, which prevailed at that time, on April 19th, 1837. He was followed to the tomb by the academicians, artists, and others to the number of upwards of three hundred; and his last work, his unfinished fresco of St. Marco, was brought to the procession. His daughter Teodina practices as an artist, in subjects of the same kind as her father.

(Giuseppe Saccii, in Tipaldi's Biografia; Westminster Rev., vol. iv.)

MIKANIA, a genus of plants belonging to the natural order Compositae, to the suborder Tubuliflorae, to the tribe Eupatoriacese, and the subtribe Adenostylaceae. It has a thorny stem, some hairy, some not; the leaves divided, with a branchlet at the base or below it; the tube of the corolla short, with the throat dilated and somewhat campanulate; the anthers somewhat protruded; the achene angular; the pappus in 1 row, rough and hairy.

2 Q 2
M. officinalis has an erect, smooth, nearly simple stem, with leaves decussating somewhat triangular-ovate, coriaceous with a greenish tinge on the sides, smooth and glabrous, drooping; the pinnules corymbose and terminal. This plant is a native of Brazil, where it is called Coraço de Jace. It is a handsome plant. The leaves contain a bitter principle and are used in the treatment of the same diseases as the Cascara and Chincha barks. They are said to be an especially valuable remedy in remedying fevers and in atonic dyspepsia. They are administered in the form of a tincture.

M. Guaco, Guaco plant, has an herbaceous twining stem; the branches round, sulcate, hairy; the leaves stalked, ovate, somewhat acuminate, shortly narrowed at the base, remotely toothed above, hairy; the axils axillary, stalked; the heads somewhat tertane sessile; the bractlets linear, shorter than the involucres; the involucral scales linear-oblong, obtuse, downy; the echinace smooth. This is one of the plants called Guaco in South America, and is used both internally and externally as a remedy against the bites of poisonous serpents. This plant is cultivated by the Indians for the purpose of being used. It is easily known from other plants by the large indigo blue spots that mark the under surface of its rough leaves. It is probable that the spotted character of the leaves of this and plants similarly employed, as the Cithamunorum and a species of Aristolochia, is due to their being fed on by certain species of poisonous snakes. ‘The mode of using this remedy,’ says Poppug, ‘is very simple; the wound is somewhat distended, and the fresh-pressed juice is dropped into it; the surrounding parts being wrapped with the leaves, and the juice also taken by the mouth. The tincture, made with common brandy, is also much celebrated, and recommended to travellers as a secure and portable means of cure. In Guayaquil little cakes are formed out of the fresh-pressed leaves, which, when dried in the sun, retain their activity a long time. The effect of the Guaco is not in all cases alike quick and decided; but observations, both in Maranon and Ega, prove that very often the wound is immediately closed, the pain vanished, and, with the exception of little ulcers, the cure had been effected. In Venezuela, and especially about Mucuchies, every year several persons are bitten by snakes; but the Guaco had acted so efficiently that in the memory of man only two children were known to have died of such wounds.’ Although Poppug has given so favourable an account of this remedy, he says in another place that ‘the excision and cauterisation of the wound immediately after it is received is undoubtedly the safest plan.’ Besides the guaco there are several other plants used in South America, some of which are called guaco, as the Herpetes colubrina, Dorstenia tubicina, Aristolochia cyanophylla, &c. The guaco has been tried in this country as a remedy in hydrophobia, but without success. The Uralli, or snake-poison of Brazil Guiana, is compound, and contains in it strychnia. [Stachys, P. C.]

M. opaca is a smooth climbing plant, with an angular stem; it has stalked, coriaceous, repand-toothed or nearly entire leaves, when full grown rather blunt; the heads stalked in corymbose panicles; the involucral scales oblong, rather acute; the bractlets lanceolate; involucre rather shorter. This plant is a native of Brazil, where it is called Eruc du Cebia. It is also employed against the bites of snakes, and is said to effect a cure by its powerful diuretic action. An account is given of this plant by Gomez in the Memoirs of the Royal Academy of Lisbon for 1812, where it is described as the Eupatorium crepatum.

The genus Mikania is closely allied to Eupatorium, and they belong to a group of plants in the order Compositae, the most remarkable for their activity. Dr. Linley states, in his Vertebrates, that the tribe Mikania is the most important in the production of Eupatorium glutinosum, and not of Artanthro elongata, as has been usually supposed. Of this plant Mr. Hartwig says, in a communication to Dr. Linley, ‘Matico is the Eupatorium of the guerras of Chiapas and Yucatan, a species of Eupatorium glutinosum, or the Chusullangas in the Quichua language. It forms a shrub 3-5 feet high, and is common in the higher parts of the Quichua Andes, where its properties were used by the Indians, who called it Matico. It is better known under his nick-name Matico (little Matthew), who when wounded in action applied occasionally the leaves of some unknown plant, which had the immediate effect of stopping the bleeding. A shrub frequently used to be the Chusullangas, which has since been called, in honour of its discoverer, Matico. That it is the true Matico of the inhabitants of Quito and Riobamba I have not the slightest doubt; it is a plant, to my mind, not only valuable to myself, and upon comparing the latter with Kunth’s description I found them to agree exactly with his Eupatorium glutinosum. The Matico has been used in Europe, and is said to be an important remedy in stopping the bleeding from small wounds.

(Poepigg, Reise in Chich, Peru, &c.; Lindley, Vegetable Kingdom; Lindley, Flora Metea.)

MILITARY DISCIPLINE. We have little knowledge of the manner in which offences against military discipline were punished by the Greeks; but it appears that, for sedition or mutiny, the commander of an army had the power of putting any man to death. The mutiny took place partly in consequence of the jealousy excited by the favour which he showed to the Persians, caused thirteen of his Macedonians to be executed without a trial. (Arrian, Anul., viii. 8.) The military law of Athens prescribed the punishment of death for the crime of desertion while on service; yet occasionally, for this serious offence, the party was only imprisoned or sentenced to pay a fine. Whatever might be the power of an Athenian commander over his soldiers in the field, it is probable that he would only have recourse to very severe punishment in the case of the termination of a campaign, a man who might consider himself unjustly treated could compel his officer to answer for his conduct before a tribunal of his countrymen. Among the Macedonians, but especially the detachment of the troops which was left to guard and garrison Sestos, the extreme penalty was, when at home, to wear a party-coloured dress, and be obliged to submit in silence to any insult which the master of the house chose to offer. A grace also fell upon the soldier who, in action, had the misfortune to lose his shield.

The Romans punished crimes committed by the soldier with great severity. For the greatest offences soldiers were beheaded or crucified; and under the Pagan emperors some, probably such as professed the Christian religion, were burnt alive or exposed to wild beasts. On the occurrence of a mutiny, every tenth, twentieth, or hundredth man was sometimes chosen by lot, but generally only the ringleaders were selected for punishment. Deserters and seditionous persons were frequently, after being scourged, sold for slaves; and occasionally the offender was made to lose his right hand, or was beheaded nearly to death.

If a soldier absented himself from the spot assigned to him for the night-watch, or if he was found asleep at his post, he was the next day brought before the tribune, who having heard the evidence, on the fact being proved, sentenced him to suffer the utmost. It appears from Polybius (vi. Ex. 2) that the tribunes had the power of very greatly touching or even killing any soldier who was proved to be a traitor. The court of the staff as a signal, the persons appointed to inflict the chastisement fell upon him and struck him repeatedly with sticks or stones, frequently with such violence as to cause his death: the culprit was allowed to escape by flight if able; but in this case, he was never permitted to return to his country, or, if he did return, no person dared to afford him shelter or relief. Punishments of a like nature, but less severe, were inflicted upon a soldier who was guilty of theft, or of giving false testimony either in his own favour or against a comrade. For certain breaches of discipline the offender suffered a temporary deprivation of his pay, the forfeiture of his arms, or degradation from his rank. Sometimes he was sentenced to remain outside of the camp exposed to the chance of being taken by the enemy, or he was made to stand for a certain time in an unmilitary dress before the praetorium. In some cases it was made a capital punishment. In some cases, the exchange into a corps of inferior rank, or to be entirely dismissed from the service with disgrace. Punishment was also inflicted on a soldier for cowardice for losing his head. Among the nations of modern Europe the punishments for military offences were, till lately, no less severe than they
were among the Romans. Besides the infliction of a certain number of lashes with cords, soldiers convicted of theft, marauding, or any other breach of discipline which was not punishable with death, were sentenced to run the gauntlet as a punishment. It may then be considered that the regiment was drawn up in a double line; and each man being furnished with a small stick, generally of osier (except the grenadiers, who used their belts instead of the sticks), the culprits, naked to the waist, was either marched slowly or allowed to run as fast as he could, according to circumstances, from the head to the rear extremity between the two lines, each man striking him as he passed along. In certain cases that of the grand assault, a movement, and sometimes also from the town or district with a charge never to appear there again under pain of death. The punishment of the knout, in the Russian army, consists in the naked back of the offender being struck with a leather belt.

Cavalry soldiers were frequently punished by the picket, as it was called; this consisted in the man being made to hang by his hands from a beam during a certain time, a stake with its upper end made sharp being planted in the ground under him; so that, when from weariness he could no longer keep himself up, his foot was pierced by the stake: this kind of punishment has been long since abolished.

It happened that many of the soldiers, being goaded to madness by the severities exercised on them, either from caprice or from a mistaken opinion that strictness in the minutest details of discipline is as necessary as in points of the highest importance, considered the soldiers, who were considered as tyrants, and have afterwards, apparently without regret, suffered death for the crime.

Confinement in a dark room during a certain number of hours was a common and distinguished officer to have his absence without leave from parade, either on account of drunkenness or from any other cause, and soldiers so offending were formerly made to stand or rather to revolve in a cage or pillory which continually turned on its axis.

Besides the punishments of death and transportation, which, for great crimes, are within the scope of military law, in the British army, breaches of discipline are visited by flagellation, temporary imprisonment, that is, loss of pay, demerit, and the deprivation of certain privileges, that is, the performance of fatigue duties; but the punishments which consist in confinement to barracks and laborious employments, continued during long periods at the discretion of commanders of regiments, have been abolished by an express order from the present commander-in-chief.

While an army is in the field it is evident that breaches of discipline should be punished with extraordinary severity, and that the punishment should follow almost immediately on detection. It might be presumed that acts of treachery will seldom be committed; but unfortunately desertsions to the enemy frequently take place; the more usual crime is howe
ter, that of outrages on the inhabitants of the country, a circumstance which is generally accompanied by gross acts of violence, often murders, committed on the defenceless people; and no doubt can exist that soldiers guilty of such crimes should be subjected to the severest penalties. Even when the crime is less heinous, the well-being and peace of the safety of the army may be perilled in consequence of the spirit of resentment induced in the inhabitants of the country by injuries inflicted on them; such disorders should therefore be repressed by making signal examples of the offenders. It may be said also that the vice of drunkenness in soldiers deserves, in general, the heaviest punishment: the miscarriage of an enterprise, and defeat, with the loss of numbers of gallant men in an action, may be the fatal consequences of a failure, from inebrity, in the delivery of a report or order. That of a gun is the greatest crime, and the punishment of an offender should be if possible immediate is also evident: the army may change its position or cantonments, when, if any delay takes place, it may be impossible for the necessary orders to be carried out. For these reasons, the same crime is punished by the accidents of war. A long interval between the commission of a crime and its punishment diminishes the fear of the latter by opening to the culprit another chance of escape. But in those events, the sentence be
ing a warning: the impression produced by the crime wears off, and the punishment assumes, in some measure, the appearance of an act of cruelty. The circumstance that an army in a time of peace and in a time of war, or rather when in the presence of an enemy, are very different: in the former case soldiers have no opportu

MILITARY TENURES. [FREEDOM, F. C.]

MI'LLIUM, a genus of grasses belonging to the tribe Agrostidieae. It contains only one British species; the meadow-grass, which is a common, low-growing, diffuse panicle, with acute Spikelets, smooth, a stem, and linear-lanceolate leaves. It has a stem 5 or 4 feet in height, and is found in damp shady woods.

(Millinton in The British Botany.)
MILLINGEN, JAMES, a very eminent English archaeologist, was born in London, on the 18th of January, 1774. His father, who was a Dutch merchant, placed him at an early age at Westminster School; the boy showed a great partiality to everything connected with ancient coins, having frequent opportunities of seeing a good collection in the house of one of his father’s friends. His principal study in his leisure hours was the science of war, and he was anxious to enter the army in the event of the country being at all protractive. In the autumn of 1793, his father determined to send him from Westminster to one of the universities. However, the French revolution, which broke out at the time, changed his plans, for Millingen’s father was a bad talker, and his new pursuits were not to his taste; he devoted all his leisure hours in the study of such works as Vaillant, Beauvois, Pinkerton, and Polybius, and his savings were spent in the purchase of ancient coins, of models of cannon, projectiles, and other materials of war, until after some time he obtained an employment better suited to his pursuits, and was appointed to the mint. In this capacity he became acquainted with several men of distinction and archaeologists, among whom we may notice the Abbé Bartholdy, brother of the well-known author of the ‘Voyage du Jeune Anchareis en Grèce,’ the geographer Barbé du Bocage, Walckenaer, D’Aumont, and others. The habit formed in such company, however, were not of long duration, for when the National Convention ordered the confinement of every British subject until the peace, the young archaeologist was arrested in the dead of night, and was constrained to leave his native country. He escaped incarceration, but he was ordered to quit Paris under the surveillance of the police. In the Prison des Ecossois James Millingen became acquainted with Charles Esté and Sir Robert Smith, who after their liberation established a banking-house at Paris, in which James Millingen became a partner. Shortly afterwards an event occurred which opened the way to Millingen’s wide field of speculation. Some labourers, who were working near Abbéville, discovered a Roman entrenchment, and dug up several earthen vessels filled with gold coins of Roman emperors down to Septimius, Severus, Caracalla, and Geta. Most of them were in a most excellent state of preservation, and some of them were extremely scarce. Millingen purchased them at the value of their weight, and soon after disposed of them in France and England to great advantage. From various circumstances this house in which Millingen was a partner failed, and he was thus thrown upon his own resources. His perfect knowledge of coins and the relics of ancient art had in the meantime made his name known throughout Europe, and he would not have retired to England, but his well-proportioned constitution rendered it necessary for him to reside in a southern climate, where he enjoyed comparative good health. During the last twenty-four years of his life he resided in Italy; at first in Rome, and latterly in the city of Florence. He made occasional visits to Paris and London, where his arrival was always hailed by archaeologists, as he was considered one of the best critics of that ancient art. In 1845 he resolved to return to England, with a view of settling in London, when he was attacked by a severe catarhal affection. At first he thought little of his illness, and wrote several letters even the day before his death, but on the 1st of October he died without a struggle, at the age of seventy-two, more from the effect of exhaustion than of disease.

What Millingen has done for practical archaeology is of the highest importance for the sciences, and work was also published by the author in French. 4, ‘Antient Coins of Greek and Cities, and Kings,’ London, 1821, 4to., with figures; 5, ‘Antient medals and Monuments of Greece, and Art,’ London, 1822 and 1826, 2 vols. 4to.; 6, ‘Remarks on the State of Antiquity in the Roman Provinces,’ London, 1831, 8vo.; 7, ‘Syllago of Antient Unedied Coins,’ London, 1837, 4to. with figures; 8, ‘Considerations sur la Monnais’ de l’Ancienne Itale,’ and a supplement, Florence, 1844, 8vo. Besides these great works, there are a considerable number of essays on antiquities subjects by Millingen, in the ‘Annales’ and the ‘Bulletino’ of the Archaeological Institute of Rome, and in the ‘Transactions’ of the Royal Geographical Society of London.

CLASSICAL MUSEUM, part xi. p. 91, &c.) MINERALOGY. It will be seen by the number of substances now added under this head, that mineralogy has made considerable progress of late years. To the new substances which have been discovered, and which are now described, are added some which had before accidentally escaped insertion. In various treatises on mineralogy there will be found descriptions of some bodies which we have not omitted to notice, and in those cases it is to be considered that the substances did not appear to possess the novelty ascribed to them, or had been previously described by other names. We mention this as a general rule, though we are not without apprehension that minerals may by mistake have been omitted which ought to have been inserted.


ALUMINA, Sulphate of, occurs in crystalline efflorescent masses. Colour white, occasionally yellowish. Translucent. Lustre silky. Taste similar to that of alum. Very soft. Specific gravity 1.66. Found at Arya near Cumanas, and near Calama in Bolivia. Analysis—Sulphuric acid, 36.4; alumina, 16; water, 46.6; peroxide of iron, 0.4. Dr. Thomson’s analysis gives 2.26 per cent. of soda.


ALMONDITE occurs in thin laminae and in thin lamellae. Specific gravity 2.94. Found at Chardesford near Penig in Saxony, and at Arendal, Norway. Analysis—Boric acid—Phosphoric acid, 54.12; alumina, 38.36; lithia, 6.92.


ANHYDRITE (Anhydrous Sulphate of Lime) occurs massive and crystallized. Primary form a right rhombohedral prism. Cleavage very distinct parallel to the terminal planes and their two diagonals; parallel to the lateral planes indistinct.
MIN

Fracture uneven. Colour white, bluish, violet or reddish. Streak greyish white. Lustre vitreous, peary on the cleavage surfaces. Hardness 3-3 to 3.5. Transparent, translucent.

Refraction double. Specific gravity 2.9- to 2.9-9. Massive variety amorphous. Found at Halle in the Tyrol, Bex in Switzerland, and in the salt-mines of Upper Austria and Salzburg, &c. Analysis of a specimen from Aus: Sulphur, 67; lime, 43; silica, 3.

AMORPHITE occurs crystallized. Primary form a rohdohedron. Cleavage parallel to the primary planes. Colour white, sometimes yellowish or brownish from an admixture of oxide of iron. Fracture uneven. Hardness 3 to 4. Lustre vitreous. Translucent. Specific gravity 2.9 to 3. Found in Salzburg and in the Alps, &c. Analysis, by Berthier: Carbonate of lime, 51.2; carbonate of magnesium, 25.7; carbonate of iron, 20.9; carbonate of manganese, 3.5 to 99.8.

ANHIDROITE occurs crystallized. Primary form a doubly oblique prism. Colour white. Streak white. Fracture conchoidal. Hardness 6-9. Lustre vitreous, inclining to peary on the cleavage faces. Translucent to transparent. Specific gravity 2.9-5. Found in Montes Semnos. Analysis, by Bose: Silica, 44.9; alumina, 34.46; lime, 16-86; magnesia, 5-25; oxide of iron, 0.74.

ANTHOPHYLLITE occurs in crystalline masses with a fibrous columnar structure parallel to the long axes of a rhombic prism, and to both its diagonal. Colour brown and yellowish brown. Streak white. Fracture uneven. Hardness 5 to 5.5. Lustre pearly and inclining to metallic. Translucent to transparent. Specific gravity 3 to 3.5. Found at Kongbog and Modum in Norway, and in the United States, &c. Analysis, by Gmelin: Silica, 56; protoxide of iron, 15; magnesia, 23; protoxide of manganese, 4; lime, 2.5.

ANTHROXITE [ZOLLER, P. C.]

ARGUSITE occurs amorphous. Cleavage parallel to the lateral planes and both the diagonals of a rhombic prism. Colour blue. Fractal uneven. Hardness 3-5. Lustre vitreous. Opal. Specific gravity 3.4 to 3.5. Found in Norway and Greenland. Analysis, by Dr. Thomson: Silica, 96.6; protoxide of iron, 30-164; sesqui-oxide of manganese, 4.9; lime, 15.9; magnesia, 4.56. Anal., by Bottger: Oxyde of oxide of iron, 28.19; oxide of zinc, 45.64; carbocid acid, 16-68; water, 9.98.

AVACHINITE [ZOLLER, P. C.]

BARITE occurs crystallized. Primary form a doubly oblique prism. Colour green or greyish black. Fracture fibrous, with a fibrous structure. Analysis, by Fross: Muriate acid, 16-6; oxide of copper, 76.6; water, 12-8.

BDEREGITE occurs amorphous, sometimes granular, or in massive masses. Colour white, green, or greenish grey, transparent. Hardness low. Found at Lektowsk in the Ural Mountains. Analysis, by Bottger: Oxyde of copper, 28.19; oxide of zinc, 45.64; carbocid acid, 16-68; water, 9.98.

BISMUTHITE [ZOLLER, P. C.]

BAHMATITE occurs crystallized. Primary form a doubly oblique prism. Colour black or greenish black. Fracture uneven. Hardness 5 to 6. Lustre vitreous. Faintly translucent. Specific gravity 3.5. Found at Arendal in Norway, the Shetland Isles, and United States at Charleston, Mass. Analysis, by Arpe, of a specimen from Arendal: Silica, 54.4; protoxide of iron, 12.8; lime, 18-6; magnesia, 2-2; protoxide of manganese, 1.6; alumina, 0.98; volatile matter, 0.9.

BALTICITE is composed of longitudinal fibres adhering to each other. Lustre silky, opaque, but in thin pieces transparent on the cleavage. Colour black, green, or greenish black. Fractal uneven. Hardness 5-6. Lustre vitreous. Faintly translucent. Specific gravity 2.6. Found at Baltimore, U.S.A. Analysis, by Dr. Thomson: Silica, 40:95; magnesia, 34-7; protoxide of iron, 10:05; alumina, 1-50; water, 12-60.


BAROINTOMITE [SHOTTEN, P. C.]

BEZERKITE occurs crystallized in masses confusedly lamellar, or composed of distinct elongated prisms. Cleavage parallel to the axis of the prism. Colour dark steel grey, inclining to brown. Lustre metallic. Found at Chaselles in

Austere, and at Braunsdorf, near Freyberg, Saxony. Analysis, by Berzelius: Antimony, 52.0; sulphur, 30-5; iron, 16; zinc, 0-8.

BERZELITE occurs massive. Colour silver-white. Streak shining. Lustre metallic. Soft, and admits of being smoothed with a small iron ball and polishes a colour of tin. When exposed to the air, undergoes decomposition and becomes black, and frequently occurs of this colour in detritic forms and thin seams. It is found at Smalund in Sweden. Analysis, by Berzelius: Carbonate of tin, 64 = 104.

BERZELITE [LEAD, P. C.]

BERZELITE [MAGHISAN PHARMACOLITE.]

BOLTONITE [FICHEMERITE.]

BORISPOKTOITE [BROKTOITE, P. C.]

BORBORITE occurs crystallized. Primary form a cube. Cleavage parallel to the planes of the octahedron, imperfect. Colour yellowish, greyish or greenish white; streak white. Fracture uneven or imperfectly conchoidal. Hardness 7-0. Lustre vitreous. Transparent, translucent. Specific gravity 2.9 to 3. Found at Segeberg near Kiel in Holstein, Lamberg in Brunswick, and near Turpaca in Peru. Analysis, by Arfwedson: Boricate acid, 69.70; magnesia, 30-30.


BOULOGHRITE (Sulphate of Lead and Antimony) occurs massive. Colour grey. Fracture exhibits a crystalline structure. Lustre metallic. Specific gravity 5.97. Found at Molieres in France and at Nertschinsk. Analysis of the ore from Molieres, by Boulangier: Lead, 53.9; antimony, 25-4; sulphur, 18-4; iron, 2-9; copper, 0-8.

BOURJONITE, compound of the sulphates of lead, antimony, and copper. Colour massive and crystallized. Primary form a right rhombic prism. Cleavage parallel to the primary axes and to both the diagonals of the prism. Colour steel or blackish grey; streak similar. Fracture uneven, conchoidal. Hardness 2-5 to 3-0. Lustre metallic. Opal. Specific gravity 5-79 to 5-83. Found in Cornwall, Cluasthal Pfaffenberg, Mexico, and Peru. Analysis, by Hatchett, of the mineral from Cornwall: Sulphur, 17; lead, 49.28; antimony, 24-28; copper, 12-90; iron, 1-20.

BRAUNITE [MAGNASE, P. C.]

BREitelITe occurs crystallized in delicate capillary crystals of a reddish-brown or chestnut-brown colour, bent and ground like wool. Fibre flexible. Lustre metallic. Found at Veum and Capo di Bove, near Rome, forming woolly coatings in the cavities of the cavities. It contains silica, alumina, and oxide of iron, but in proportions which have not been determined.

BRENNERITE, Bakelite (Carbonate of Magnesia and Iron) occurs crystallized. Faintly translucent, upon an obtuse edge. Colour perfect, parallel to the primary planes. Colour yellow of different shades, and black; streak white. Fracture flat conchoidal. Hardness 4-0 to 4-3. Lustre vitreous, sometimes inclining to pearly. Transparent, translucent. Specific gravity 8-0 to 3-2. Found at Zillertal in Salzburg and other places in the Tyrol. Analysis, by Stromeyer: Carbonate of magnesia, 86-05; carbonate of iron, 15.82; carbonate of manganese, 0-87.

BRENNERITE [ZOLLER, P. C.]

BROCHANTITE (Sulphate of Copper and Water) occurs crystallized. Primary form a right rhombic prism. Cleavage obtained with difficulty, and at the direction of the base of the primary form. Colour emerald-green. Fracture uneven. Hardness 3-5 to 4-0. Lustre vitreous. Translucent, translucent. Specific gravity 3-79 to 3-87. Found in Siberia. Analysis, by M. L. Scopoli: Sulphure acid, 47-17; water, 66-93; oxide of tin, 8-14; oxide of lead, 1-04; water, 11-91.

BROGNIONITE [GLAUCASTERITE, P. C.]

BROGNIONITE occurs in massive aggregations of columnar crystals. Cleavage obtuse to the base of the prism, and both diagonal of a rhombic prism. Colour brown, ash-grey, or dark green; streak lighter. Fracture uneven. Hardness between 4-0 and 4-3. Lustre vitreous. Pseudo-metallic on cleavage planes. Transparent in thin laminae. Mass. Specific gravity 3.3. Found in Upper Styria, the Hartz, in Bayersuth, the Tyrol, the Lizard district of Cornwall,
MIN 304  MIN

Analysis, by Kohler: Silica, 57.19; magnesia, 32.87; lime, 1.29; protocatechuic acid, 7.46.

Brookite. [TITANIUM, P.C.]

Brookite is a black, translucent, opaque mineral. Its crystal structure is monoclinic. The formula is TiO

Cacholong. [OPI, P.C.]

Cadmium, Sulphate of. [CROMBERGERITE]

Cadmium occurs naturally as a by-product of the electrolytic refining of copper. It is extracted from solutions of cadmium sulfate.

Cadmium occurs crystallized. Primary form a rhombohedral prism. Cleavage parallel to the cleavage planes, and the cleavage direction of the prism. Color greenish yellow; streak black; fracture uneven. Hardness 3.5 to 5.0. Luster vitreous to resinous. Transparent, translucent. Found near Taviostock, Devonshire, and at Criniss, Cornwall. Analysis, by Wollaston: 70% of cadmium, 25% of lead, 5% of copper, 4% of zinc, 2% of arsenic, 1% of manganese, 1% of iron, 0.1% of sulphur, and 0.5% of water.

Cobaltite. [ZIEGLER, P.C.]

Cobaltite occurs crystallized. Primary form a rhombohedral prism. Cleavage parallel to the cleavage planes, and the cleavage direction of the prism. Color greenish yellow; streak black; fracture uneven. Hardness 3.5 to 5.0. Luster vitreous to resinous. Transparent, translucent. Found near Taviostock, Devonshire, and at Criniss, Cornwall. Analysis, by Wollaston: 70% of cobalt, 25% of lead, 5% of copper, 4% of zinc, 2% of arsenic, 1% of manganese, 1% of iron, 0.1% of sulphur, and 0.5% of water.

Color: greenish yellow.

Congo Rutile. [TITANIUM, P.C.]

Congo Rutile is a black, opaque mineral. Its crystal structure is monoclinic. The formula is TiO

Copper. [CROMBERGER, P.C.]

Copper is a metallic element with the symbol Cu. It is a ductile, malleable, and corrosion-resistant metal. Copper occurs in nature as native copper and as copper minerals.

Copper occurs crystallized. Primary form a rhombohedral prism. Cleavage parallel to the cleavage planes, and the cleavage direction of the prism. Color greenish yellow; streak black; fracture uneven. Hardness 3.5 to 5.0. Luster vitreous to resinous. Transparent, translucent. Found near Taviostock, Devonshire, and at Criniss, Cornwall. Analysis, by Wollaston: 70% of cobalt, 25% of lead, 5% of copper, 4% of zinc, 2% of arsenic, 1% of manganese, 1% of iron, 0.1% of sulphur, and 0.5% of water.

Cork. [TITANIUM, P.C.]

Cork is a natural, renewable material obtained from the bark of the cork oak tree. Cork is a popular insulating material and is used in a variety of applications.

Criniss. [TITANIUM, P.C.]

Criniss is a town in the county of Cornwall, England, known for its association with the mining of copper and tin. The town has a long history of mineral production.

Crombergerite. [TITANIUM, P.C.]

Crombergerite is a mineral that occurs in the form of crystals, typically in a prismatic habit. It is a black, opaque mineral. The crystal structure is monoclinic. The formula is TiO

Crombergerite occurs crystallized. Primary form a rhombohedral prism. Cleavage parallel to the cleavage planes, and the cleavage direction of the prism. Color greenish yellow; streak black; fracture uneven. Hardness 3.5 to 5.0. Luster vitreous to resinous. Transparent, translucent. Found near Taviostock, Devonshire, and at Criniss, Cornwall. Analysis, by Wollaston: 70% of cobalt, 25% of lead, 5% of copper, 4% of zinc, 2% of arsenic, 1% of manganese, 1% of iron, 0.1% of sulphur, and 0.5% of water.

Crossite. [TITANIUM, P.C.]

Crossite is a mineral that occurs in the form of prismatic crystals. It is a black, opaque mineral. The crystal structure is monoclinic. The formula is TiO

Crossite occurs crystallized. Primary form a rhombohedral prism. Cleavage parallel to the cleavage planes, and the cleavage direction of the prism. Color greenish yellow; streak black; fracture uneven. Hardness 3.5 to 5.0. Luster vitreous to resinous. Transparent, translucent. Found near Taviostock, Devonshire, and at Criniss, Cornwall. Analysis, by Wollaston: 70% of cobalt, 25% of lead, 5% of copper, 4% of zinc, 2% of arsenic, 1% of manganese, 1% of iron, 0.1% of sulphur, and 0.5% of water.

Cyanobium. [TITANIUM, P.C.]

Cyanobium is a mineral that occurs in the form of prismatic crystals. It is a black, opaque mineral. The crystal structure is monoclinic. The formula is TiO

Cyanobium occurs crystallized. Primary form a rhombohedral prism. Cleavage parallel to the cleavage planes, and the cleavage direction of the prism. Color greenish yellow; streak black; fracture uneven. Hardness 3.5 to 5.0. Luster vitreous to resinous. Transparent, translucent. Found near Taviostock, Devonshire, and at Criniss, Cornwall. Analysis, by Wollaston: 70% of cobalt, 25% of lead, 5% of copper, 4% of zinc, 2% of arsenic, 1% of manganese, 1% of iron, 0.1% of sulphur, and 0.5% of water.

Cyanobium occurs crystallized. Primary form a rhombohedral prism. Cleavage parallel to the cleavage planes, and the cleavage direction of the prism. Color greenish yellow; streak black; fracture uneven. Hardness 3.5 to 5.0. Luster vitreous to resinous. Transparent, translucent. Found near Taviostock, Devonshire, and at Criniss, Cornwall. Analysis, by Wollaston: 70% of cobalt, 25% of lead, 5% of copper, 4% of zinc, 2% of arsenic, 1% of manganese, 1% of iron, 0.1% of sulphur, and 0.5% of water.

Cyanobium occurs crystallized. Primary form a rhombohedral prism. Cleavage parallel to the cleavage planes, and the cleavage direction of the prism. Color greenish yellow; streak black; fracture uneven. Hardness 3.5 to 5.0. Luster vitreous to resinous. Transparent, translucent. Found near Taviostock, Devonshire, and at Criniss, Cornwall. Analysis, by Wollaston: 70% of cobalt, 25% of lead, 5% of copper, 4% of zinc, 2% of arsenic, 1% of manganese, 1% of iron, 0.1% of sulphur, and 0.5% of water.

Cyanobium occurs crystallized. Primary form a rhombohedral prism. Cleavage parallel to the cleavage planes, and the cleavage direction of the prism. Color greenish yellow; streak black; fracture uneven. Hardness 3.5 to 5.0. Luster vitreous to resinous. Transparent, translucent. Found near Taviostock, Devonshire, and at Criniss, Cornwall. Analysis, by Wollaston: 70% of cobalt, 25% of lead, 5% of copper, 4% of zinc, 2% of arsenic, 1% of manganese, 1% of iron, 0.1% of sulphur, and 0.5% of water.
Fracture conchoidal. Hardness 5 to 5.5. Lustre vitreous.
Transparent, translucent, opaque. Specific gravity 2.4.
Found in a thin limestone quarry near Waldheim in Saxony. Analysis, by Ficinus: Silica, 35.85%;
magnesia, 23.70%; prototioxide of iron, 11.33%;
prototioxide of manganese, 2:50; alumina, 0.416; lime, 0.603; water and carbon dioxide, 20.95.
DIALOGUE. [AGOT, P.C.]
DIAPOROS occurs massive and crystallized. Primary form a doubly oblique prism. Colour slightly greenish grey and yellowish brown. Hardness 6 to 6.5. Slightly translucent. Specific gravity 3.43. Found at Kosoibrod in the Orenburg government of Asiatic Russia. Massive variety occurs in slightly curvilinear laminae of a shining nearly lustre and greenish grey colour; also in cellular masses, constituted of slender crystals, which have a pearly lustre and intercrop each other in every direction; of a brown hue externally, but perfectly transparent and colourless when reduced to thin laminae. Colour index 14; luster, 14.46.
The brown variety, analyzed by Children, gave—alumina, 76.06; water, 14.70; oxide of iron, 7.78; loss, 1.46.
DICHROITE (Iride, Pielmo, Steinbeleite, Cordierite) occurs massive and crystallized. Primary form a rhombohedron, commonly crystallized in six- or twelve-sided prisms. Cleavage parallel to the lateral planes. Colour blue in direction of the axis, and yellowish grey perpendicular to it; sometimes dull yellowish in both directions. streak white. Fracture uneven and somewhat conchoidal. Hardness 7 to 7-8. Lustre vitreous. Transparent, translucent. Specific gravity 2.66. Massive varieties amorphous. Structure inchoate. Fracture conchoidal. Portion of a bed of 100 fathoms in thickness. Analysis, by Gmelin: Silica, 53.16; alumina, 14.03; lime, 14.89; magnesia, 5.2; soda, 2.61; oxide of iron, 7.14; oxide of manganese, 0.64; water, 0.60.
ECCHERNIT (Arzenite of Copper) occurs crystallized. Primary form a rhombic prism. Cleavage indistinct. Colour light greenish grey. Streak white, shining. Hardness 6.5 to 7. Lustre feeble, shining, or dull. Opaline. Specific gravity 3 to 3.1. Found near Eids in the Saxon Eingebolshofen, a bed of 100 fathoms in thickness. Analysis, by Gmelin: Silica, 53.16; alumina, 14.03; lime, 14.89; magnesia, 5.2; soda, 2.61; oxide of iron, 7.14; oxide of manganese, 0.64; water, 0.60.
ECHELORITE occurs massive without any trace of cleavage. Colour brownish black. In thin splinters has a reddish brown transluclency, lighter than the streak. Streak reddish brown. Fracture subconchoidal. Hardness, scratches thorite. Lustre metallic, grey to black; streak white. Fracture uneven. Analysed, in Norway. Analysis, by Scherer: Columbic acid, with some tinic acid, 46-98; tinic acid, 7.94; yttria, 26-69; prototioxide of uranium, 0.14; prototioxide of cerium, 2.18; oxide of lanthanum, 0.65; lime, 2.47; magnesia, 0.28; water, 3.97=98.90.
ECHELORITE. [FAYRIZHE, P.]
ECHELORITE occurs crystallized in the form of a thin octahedron with a square base. Colour white, sometimes brown. Fracture vitreous or uneven. Frangible. Lustre brilliant. Found at Kaisarmuths in Breisgau. Analysis, by Damour: Silica, 49.36; alumina, 10.77; lime, 5.00; soda, 3.04; water, 23.49.
FIBROLITE. [KAINITIS, P.C.]
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FIBROLITE. [KAINITIS, P.C.]
granular and conoidal. Colour lead grey. Streak the same. Hardness between mica and calcareous spar. Lustrous metallic.

Oplutens: 4-5. Found in the silver-mine at Alhambra, Mexico. Analysis, by Herrera: carbonic acid, 31-86; peroxide of anhydrous, 12-22; tellurium, 55-58. This mineral is probably a mixture rather than a definite compound.

Heraldine: [Maflente, Ores of, P. C.]

Herlandite: [Zeolites, P. C.]

Hisingerite: [Thraustite, P. C.]

Honey-stone: [Melrite, P. C.]

Horn-stone: [Dumrite, P. C.]

Horn-stone, Fusible: [Fusite, P. C.]

Hornstone, Infusible: [Quartz, P. C.]

Humboldtite: [Sorrelite, P. C.]

Hydronoracite occurs in small needle crystals, which appear to be flat six-sided prism. Colour white, with spots of red from silicified peroxide of iron. Hardness similar to that of pyrophyllite. Specific gravity 2-04. Found in a collection of Caucasian minerals. Analysis, by Hess: Boracic acid, 49-22; lime, 13-74; magnesia, 10-71; water, 26-83.

Hydrohalite occurs massive, investing steatite in foliated masses. Colour white. Streak the same, with a pearly lustre. Translucent, with a soaply feel. Hardness 2. Found at Sarum. Analysis: Magnesia, 30-30; alumina, 12-90; peroxide of iron, 6-50; carbonic acid, 10-54; water, 32-06; insoluble residue, 1-20.

Hydromagnesite: [Magnesite.]

Hydrochlorite: [Greek Iron Earth.]

Hydrochrome: [Greek Iron Earth.]

Hydrocystite: [Hydromagnesite, Ores of, P. C.]


Iron: [Titanous, Ores of, P. C.]

Jasper: [Quartz, P. C.]

Johannisite: [Uralium, Ores of, P. C.]

Johnstonite: [Lead, Ores of, P. C.]

Kammererite: occurs crystallized and massive. Common form of the crystal a six-sided prism. Cleavage perpendicular to the axis only. Cleavage places have a pearly lustre. Colour, that of some crystals, which by daylight is dark that their red colour is scarcely perceptible, appears by candlelight quite red. Rarely, usually composed of fine laminae. Colours sometimes dark violet blue, sometimes yellowish or greenish, or greenish white. Translucent on the edges, particularly after immersion in water. Fracture compact, sub- or non-glistening sublustrary. Irregular variety, usually composed of fine laminae. Found in the Ural mountains. Analysis, by Hartwell: Silica, 37-0; alumina, 14-2; magnesia, 31-5; lime, 1-5; oxide of chromium, 1-0; water, 13-0.

Kerkinite occurs massive and reniform. Structure lamellar or compact. Colour white, yellow, or green. Streak white. Fracture conchoidal. Hardness 2-0 to 2-5. Lustre vitreous or resinos. Transparent, translucent. Specific gravity 2-040. Found in the Ural mountains. Analysis, by Hartwell: Silica, 37-0; alumina, 14-2; magnesia, 31-5; lime, 1-5; oxide of chromium, 1-0; water, 13-0.


Kersite: [Magnetite, Ores of, P. C.]

Kersite resembles sulphur of antimony, but is more

**Kollertite (Hydrous Silicate of Alumina)** occurs massive. Colour white. Fracture earthy. Nearly opaque. Lustre submetallic. Specific gravity 3-5. Found at Schenken in Hungary, and in a load-mine on the bank of the river Oo in the Pyprenees. Analysis, by Berthier: Silica, 19; alumina, 44.5; water, 44.5; oxide of iron, 1-45; oxide of copper, 1-08; ginger, 1-49 to 99.4.

**Lecithnite (Hydrous Silicate of Alumina)** occurs massive. Colour white. Fracture earthy. Nearly opaque. Lustre submetallic. Specific gravity 3-5. Found near Wolschthain in Russia. Analysis, by Berthier: Silica, 19; alumina, 44.5; water, 44.5; oxide of iron, 1-45; oxide of copper, 1-08; ginger, 1-49 to 99.4.

**Lecithnite (Phosphate of Copper)** occurs in small octahedral crystals and in massed masses. Primary form a right rhombic prism. Colour dark green. Streak green. Fracture uneven. Hardness 4-0. Translucent. Lustre resinous. Specific gravity 3-6. Found at Libethen in Hungary. Analysis, by Berthier: Phosphoric acid, 20.7; oxide of copper, 63.9; water, 7-4.

**Ligurite.** Primary form an obtuse rhombic prism. Colour olive green. Streak greenish grey. Fracture uneven. Hardness about 2-0. Transparent. Lustre resinous. Specific gravity 3-0. Found on the banks of the Stura in the Apennines of Liguria. Analysis, by Viviani: Silica, 57-45; alumina, 7-36; carbonates of lime and magnesia, 25-90; oxide of iron, 1-56; oxide of manganese, 0.58 to 0.16.

**Lime.** Occurs crystallized. Primary form an obtuse rhombic prism, and from one to one-fourth of an inch long. Colour fresh yellow. Fracture conchoidal. Hardness rather less than calcars. Very brittle. Lustre similar to that of sulphur of lead. Transparent. Fracture. Specific gravity 1-833. Supposed to have come from Hungary. Analysis, by Sandell: Oxygen composition to be oxalate of lime with one equivalent of water.


**Magnesia Alem occurs massive. Structure fibrous, also compact. Colour white. Streak white. Colour white. Streak white. Found at Cape Verde, in Southern Africa, where it covers the floor of a grotto to the depth of six inches. Analysis, by Stromeyer: Sulphate of alumina, 38-996; sulphate of magnesia, 10-990; oxide of manganese, 4-97; chloride of potassium, 0.205; water, 45-739.

**Magnesia, Hydrate of.** [Shepardites.]

**Magnesite (Carbonate of Magnesia)** occurs in acicular crystals, massive, and in powder. Colour usually white, occ-
casionally greyish and yellowish. The massive varieties are found amorphous, reniform, nodular, and stalactitic. Fracture splintery or flat conchoidal. Hardness exceeds that of calcite.

Specified gravity 2.8. Known in several parts of Europe, as Styria, Moravia, Spain, and Silesia, in India, and at Hoboken in New Jersey, North America. Analysis, by Rammelsberg: Carbonic acid, 52.21; mica, 19.77; water, 24.02.

Malachite occurs in these plates and massive. Fracture uneven or conchoidal. Colour white or yellowish. Streak shining. Soft like wax. Lustre waxy, weak. Streak transparent. Specific gravity 1.6 to 1.8. Known at St. Dorffal between Lohau and Bazzen, and near Bora in Bohemia. Analysis, by Melasmer: Silica, 50.2; alumina, 10.7; lime, 0.2; peroxide of iron, 31; water, 35.6.

Margarite (Pearl Mica) occurs in thin hexagonal crystals, and in masses of small thin shining laminae. Primary form a rhombohedron. Cleavage distinct parallel to the bases, and distinct parallel with the sides. Colour greyish, reddish, and yellowish white. Streak white. Fracture not observable. Hardness 3.5 to 4.5. Rather brittle. Lustre pearly on the terminal faces, vitreous on the others. Translucent. Specific gravity 3.5 to 4.1. Found at Sterling in the Tyrol. No accurate analysis appears to have been made.

Marcelite (Anhydrous Sili cate of Detonix of Magnesia) occurs crystalline in octahedrons with a square base. Colour greyish black. Lustre slightly metallic or vitreous. Forms perfect crystalline, 12 faces. Analysis, by Bernasch: Silica, 15.17; oxide of magnesia, 75.90; oxide of iron, 4.14; alumina, 2.86. The analysis by Berthier gives considerably more silica and less oxide of magnesia.

Marcasite, Ore of Iron (Marcasite, Marcassite, Marcasite Iron Ore) occurs massive. Structure columnar, irregularly intersecting. Columnar portions foliated, having a cleavage in two directions intersecting each other at nearly right angles and giving a pearly and lustrous. Translucent, opaque. Specific gravity 4.27. Found at Hoboken, New Jersey, and the Bare Hills, near Baltimore, United States. Analysis, by Nuttall: Silica, 56; magnesia, 46.8; lime, 1.9; water, 40.1.

Mardagn (Sulfate of Ammonia) occurs stelactitic, pustuliferous, or efflorescent. Colour yellow or greyish. Taste acid, bitter. Translucent, opaque. Found in the fissures of the earth, and among the laves of Etna and Vesuvius, in the Sofia, and near Sienna in Tuscany. Analysis, by Gmelin: Sulfuric acid, 58.98; ammonia, 22.80; water, 23.91.


Mineral [Arsenical Minerals, P. C.] Mica. It is remarked by Brooke that several distinct appearances are included under this name, merely because they may be easily split into very thin shining plates; but they cannot at present be distinguished by any characters which have been hitherto given. He treats of the various substances belonging to this mineral, under the heads of Rhombooidal Mica; Oblique Prismatic Mica; Lepidolite, or Linne Mica [P. C.]; Margarite, Pearl Mica; Rubelians, or Red Mica; Oderit, or Black Mica [P. C.].

Rhombooidal Mica occurs in thin crystals and massive prisms. Primary form a rhombohedron. Cleavage very distinct, perpendicular to the axis. Fracture not observable. Hardness of the cleavage surfaces 2.0 to 2.5, that of the edges 3.5 to 5.5. Colour, usually grey, black, brown, pale red, brownish green. Streak white, grey. Lustre vitreous, nearly on the cleavage surfaces. Transparent, translucent. Massive varieties globular, structure fibrous, foliated. Amorphous, structure foliated, granular, fibrous, or crystalline. Oblique Prismatic Mica. Primary form an oblique rhombic prism, and according to Brooke the preceding descriptions will probably apply to this variety, except as to the form. Frank, by Rose: Silica, 47.19; alumina, 33.98; peroxide of iron, 4.47; oxide of manganese, 2.54; lime, 0.13; fluorite Acid, 0.39; potash, 8.8; water, 4.07 = 100.88.

Marmatite occurs in rounded masses, seldom larger than a pea, or in layers a sixteenth of an inch or less in thickness, between layers of coal. Colour reddish brown by reflected light, and deep red by transmitted. Powder light brown. Translucent in small fragments. Hard and brittle. Lustre resinous. No taste or smell. Blackness on exposure. Specific gravity 1.6. Found about the middle of the main coal or Haigh Moor seams at the Middleton colliers near Leeds; also at Newcastle. Analysis, by Johnston: Carbon, 46.83; hydrogen, 4.47; oxide of iron, 4.27; peroxide of iron, 3.90; oxide of manganese, 1.82; lime, 0.13; fluorite Acid, 0.39; potash, 8.8; water, 4.07 = 100.88.

Mornadrite occurs massive. Cleavage, one distinct, and another imperfect. Colour pale yellowish, verging on red. Hardness nearly that of felspar. Lustre vitreous. Specific gravity 2.63. Found at Jorgs, P. C. Analysis, by Erdmann: Silica, 56.07; magnesia, 31.63; protopside of iron, 8.56; water, 4.04.

Monticellite occurs crystallized. Primary form a right rhombic prism, rarely with a perfect prism, and having a usual axis of quartz. Colour generally yellowish. No cleavage planes have been observed. Hardness 5.0 to 6.0. Sometimes nearly transparent and colourless. Found at Vesuvius. It has not been seen in Britain.

Morandrite occurs massive and fibrous, and crystallized in flat prisms. Cleavage in one direction distinct, in others indistinct. Colour dull reddish-brown. Streak greyish brown. Hardness 3.0. Lustre of cleavage face between vitreous and greasy; of other surfaces resinous. Thin splinters translucent and showing a bright red colour by transmitted light. Specific gravity 2.98 to 2.98. Found at Lammanpokket in Sweden. Analysis according to Erdmann it consists mostly of silica, titanic acid, and the oxides of cerium and lanthanium, with some oxide of manganese, lime, a little magnesia, potash, and water.

Nexite. Oek occurs crystallized in acicular four- or six-sided prisms, indistinctly terminated and longitudinally striated. Cleavage parallel to the axis of the prism. Colour, when first broken, steel-grey or black lead-grey, soon acquiring a yellowish or ochreous tint. Cross fracture often conchoidal with a shining metallic lustre. Hardness 2.0 to 2.5. Opaque. Specific gravity 6.125. Found near Ekaterinburg in Siberia. Analysis, by Friek: Sulphur, 11.58; bismuth, 43.20; copper, 12.10; nickel, 1.58; tellurium, 1.32.


Nuziterite. Occurs in crystals, which are almost lenticular. Primary form a rhombohedron. It is generally found implanted in marmatite and allied to cleavelandite. Colour yellowish white, greyish. Fracture somewhat conchoidal. Hardness 4.0. Lustre greasy, feeble. Specific gravity 6.0415. Found in the mine of Nusselare, near Beauraing, dep. of Luxembourg. Analysis, by Bernasch: Phosphate of lead, 56.4; phosphate of lime, 22.20; chloride of lead, 7.66; arsenate of iron, 6.50.

Greentieite occurs crystallized. Primary form a right square prism, and prolonged parallel to the four edges. Hardness 6.5. Specific gravity 3.628. Found at Arendal, Norway. Analysis: Titanate of zirconia, 68.985; silica, 19.700; lime, 2.612; magnesia, 2.047; protopside of iron, 1.1936; water, 5.352.

OXOCLOSCE occurs crystallized. Primary form an oblique rhombic prism. Colour white, yellowish, and greenish white. For description, see previous. Analyses, by Bernalis: Silica, 56-99; lime, 26-35; water, 16-65. Specific gravity 3.2-4. Translucent. Specific gravity 2.6-4 to 2.97. Found at Davnitzske near Stockholm, Arden in Norway, &c. Analysis, by Bernalis: Silica, 63-70; alumina, 29-95; lime, 9-05; soda, 6-45; potash, 1-20; oxide of iron, 0-50.


ORTORLITE occurs in small rounded brilliant plates, with a perfect basal cleavage. Colour greyish or greenish. Streak pale green. Fracture uneven. Scratches with difficulty. Specific gravity 3.5. Found near Otrers on the borders of Luxembourg. Analysis, by Damou: Silica, 43-34; alumina, 24-83; protolite of iron, 16-72; protolite of manganese, 8-0; water, 8-0.

ORZELICHE (Carbonate of Hydrogen). Colour yellowish brown. Translucent; has a slight bituminous odour, and softens by the heat of the hand, so that it may be knotted. Fusible readily, emitting a stronger bituminous odour; burns with a clear bright flame without residue. Insoluble in water, only slightly in alcohol, but readily in ether and oil of turpentine. Found in considerable masses at Shink in the Buchan district of Scotland, and used for fuel. Analyses, by Carbon, 69-204; hydrogen, 3-876. It appears to be similar in composition to Hatchetine.

PARAGNITE. (Augite, P. C.) PRAEVENTITE, occurring on spherical masses which have a radiating fibrous structure. Colour greyish. Hardness 4-0 to 5-0. Lustre nearly opaque. Specific gravity 3.69. Found in large masses on Monte Bracho, in the Southern Tyrol. Analyses, by Von Kobell: Silica, 51-30; lime, 38-77; soda, 8-96; potash, 1-57; alumina and oxide of iron, 0-90; water, 3-89.


PHARMACOLITE, MAGNESIAN. [MAGNESIAN PHARMACOLITE]


PHARMACOSIDERITE occurs crystallized. Primary form a rhomboid. Cleavage parallel to the primary faces. Colourless; also bright yellow, yellow, inclining to red. Hardness above 5-0. Lustre vitreous. Transparent to opaque. Specific gravity 3.169. Found near Freiburg, Germany. Analysis, by Hartwell: Silica, 55-14; glucine, 44-47; alumina and magnesia, 0-39.

POLYCARITE, a hydrous silicate of alumina, probably similar to HALITEES. PHOSPHOREIT [Apatite, P. C.]

PHYLITE. [GIGANTOLITE]

PIEKAROWSKITE (Magnesia Alum) occurs in masses composed of long parallel fibres of a silky or satin lustre. Colour white, or, viewed in the direction of the fibres, pale rose-red or light green. Compact, but easily divided parallel with the fibres. Brittle. Specific gravity 1-78 to 1-80. Found at Taranipa in Peru. Analysis, by Strecker: Sulphate acid, 36-770; alumina, 11-515; magnesia, 3-690; peroxide of iron, 2-617; chlorid of potassium, 0-205; water, 45-739.

PLACOITE. [Turrite, P. C.]

PLATINE. [Nickel, Ore of P. C.]


POLISHING SLATE (Polier schiefere) occurs massive, with a flat texture. Colour white, yellowish white, or yellow. Brittle. Opague. Specific gravity 0-59. Found near Bilin in Bohemia, at Zwieka in Saxony, and Auvergne, and is supposed to be a volcanic product. Analyses, by Bucholz: Silica, 83-50; alumina, 4-00; lime, 8-90; oxide of iron, 1-50 water, 9-00.


POWERSITE. [Talc, P. C.]

PRASE. [Quartz, P. C.]

PRASEOLITE occurs imperfectly crystallized in prisms of several sides, with the edges rounded. Cleavage in one direction. Colour olive green; streak clear green. Fracture splintery and flat conchoidal. Hardness 3-5. Lustre weak. Specific gravity 2-754. Found near Breivig, Norway. Analyses, by Erdmann: Silica, 40-94; alumina, 28-79; prot-
oxide of iron, 4;06; potassium of manganese, 0;82; magnesia, 13;73; tannic acid, 0;40; oxide of lead, copper, and cobalt with lime, 0;50; water, 7;38.

P. Prasolite occurs massive. Composed of loosely adhering flakes. When dry, it is grey-green and not perfectly clear; on scraping, it is a dirty red-brown and may be crumbled to powder between the fingers. Specific gravity 2;311. Found on the Killpatrick Hills. Analysis, by Dr. Thomson: Silica, 38;55; magnesia, 15;55; peroxide of iron, 14;99; alumina, 6;65; lime, 2;96; oxide of manganese, 1;50; water, 18;00. The loss amounting to 3 per cent. is attributed to an alkali.

Prasolite [MARGANZEE, Ores of P. C.] Found at (Bouquet, N. Y.). Occurs crystallized and massive. Primary form a cube, the faces of which are usually curvilinear. Cleavage parallel to the faces of the regular octahedron, indistinct. Fracture uneven, conchoidal. Hardness 3. Colour purple-brown and reddish brown; tarnishes speedily after being cut. Streak greyish black. Luster metallic. Specific gravity 5;0. Massive variety amorphous, structure compact. Found in Cornwall and most copper mines. Analysis, by R. Phillips: 4 sp. from Bove Island, Lake of Killarney, Ireland: Sulphur, 23;75; copper, 61;07; iron, 14;00; silica, 0;50.

P. Fyrop [GABETS, P. C.] Found in Cornwall. Primary forms a rhombic prism, with one perfect cleavage, and another at right angles to this, imperfect. Colour emerald-green and apple-green; streak white. Fracture uneven and splintery. Hardness 3;0. Luster dull. Translucent. Specific gravity 2;974. Found in the island of Elba, and at Aker in Siderand. Analysis, by Von Kobell: Silica, 37;03; alumina, 18;60; magnesia, 31;62; peroxide of iron, 2;62; oxide of chromium, 1;48; water, 1;00.

PYRRHITE occurs crystallized in regular octahedrons. No cleavage observable. Colour deep orange-yellow. Hardness equal to that of felspar. Luster vitreous, brilliant. Transparent on edges. Found at Alaksesscha, near Murmansk, and at the Azores. It has not been analyzed.

RUSHIT (Soda Sulphate of Magnesia) occurs in flat six-sided prisms, acicular crystals, and needle-like efflorescences. Colour green. Fracture conchoidal to birefringent. Found in the vicinity of Seili and of Socolechus in Bohemia. Analysis, by Reuss: Sulphate of soda, sulphate of magnesia, 31;65; murate of magnesia, 2;19; sulphate of lime, 0;42.


Riolite [ZINC, Ores of P. C.] ROOMER occurs crystallized in square octahedrons, in greenish or yellowish, translucent, Colour blue-green, or honey-yellow. Hardness scratchless. Found at St. Marcel in Piedmont. Analysis, by DANCE: Antimonious acid, 79;17; lime, 16;65; peroxide of manganese, 2;16; peroxide of iron, 1;19; silica, 0;64.

R Priest occurs in small grains, without crystallization. Fracture splintery, and in the larger grains somewhat foliated. Surface of the fracture shining. Colour fain rose-red to brownish red; the former more common. Subtranslucent. Hardness 2;5. Specific gravity 2;72. Found in Siderand. Analysis, by Svenberg: Silica, 44;901; alumina, 31;506; peroxide of iron, 2;688; oxide of manganese, 0;191; potash, 0;028; lime, 3;592; magnesia, 2;499; soda, a trace; water, 6;333.

RUBELLAN (Red Mica?) occurs in small hexagonal plates, mica-like and optical. Colour greenish-brown. Hardness 2 to 2;5. Luster pearly. Transparent, opaque. Specific gravity 2;8 to 3;1. Found at Schams in the Mittelgebir ge, Bohemia. Analysis, by Klaproth: Silica, 45; alumina, 10; oxide of iron, 2;9; oxide of manganese, 0;15; of volatile matter, 5;4.

Rutile [TITANIUM, Ores of P. C.] SAULITE [PYROXENE, P. C.] SAPHIRINE occurs granular disseminated in anthophyllite. Colour olive-brown; streak greenish-brown. Fracture un- even, conchoidal. Hardness 7 to 8;0. Luster vitreous. Translucent. Specific gravity 3;42. Found at Akulke in Greenland. Analysis, by Stromeyer: Silica, 14;50; alumina, 7;11; magnesia, 16;85; lime, 0;28; oxide of iron, 3;92; oxide of manganese, 0;58; water, 0;49.


P. Fyrop [GABETS, P. C.] Found in Cornwall. Primary forms a rhombic prism, with one perfect cleavage, and another at right angles to this, imperfect. Colour emerald-green and apple-green; streak white. Fracture uneven and splintery. Hardness 3;0. Luster dull. Translucent. Specific gravity 2;974. Found in the island of Elba, and at Aker in Siderand. Analysis, by Von Kobell: Silica, 37;03; alumina, 18;60; magnesia, 31;62; peroxide of iron, 2;62; oxide of chromium, 1;48; water, 1;00.

PYRRHITE occurs crystallized in regular octahedrons. No cleavage observable. Colour deep orange-yellow. Hardness equal to that of felspar. Luster vitreous, brilliant. Transparent on edges. Found at Alaksesscha, near Murmansk, and at the Azores. It has not been analyzed.

RUSHT (Soda Sulphate of Magnesia) occurs in flat six-sided prisms, acicular crystals, and needle-like efflorescences. Colour green. Fracture conchoidal to birefringent. Found in the vicinity of Seili and of Socolechus in Bohemia. Analysis, by Reuss: Sulphate of soda, sulphate of magnesia, 31;65; murate of magnesia, 2;19; sulphate of lime, 0;42.


RIOLITE [ZINC, Ores of P. C.] ROOMER occurs crystallized in square octahedrons, in greenish or yellowish, translucent, Colour blue-green, or honey-yellow. Hardness scratchless. Found at St. Marcel in Piedmont. Analysis, by DANCE: Antimonious acid, 79;17; lime, 16;65; peroxide of manganese, 2;16; peroxide of iron, 1;19; silica, 0;64.

ROSETE occurs in small grains, without crystallization. Fracture splintery, and in the larger grains somewhat foliated. Surface of the fracture shining. Colour fain rose-red to brownish red; the former more common. Subtranslucent. Hardness 2;5. Specific gravity 2;72. Found in Siderand. Analysis, by Svenberg: Silica, 44;901; alumina, 31;506; peroxide of iron, 2;688; oxide of manganese, 0;191; potash, 0;028; lime, 3;592; magnesia, 2;499; soda, a trace; water, 6;333.

RUBELLAN (Red Mica?) occurs in small hexagonal plates, mica-like and optical. Colour greenish-brown. Hardness 2 to 2;5. Luster pearly. Transparent, opaque. Specific gravity 2;8 to 3;1. Found at Schams in the Mittelgebirge, Bohemia. Analysis, by Klaproth: Silica, 45; alumina, 10; oxide of iron, 2;9; oxide of manganese, 0;15; of volatile matter, 5;4.

Rutile [TITANIUM, Ores of P. C.] Saulite [PYROXENE, P. C.] Saphirine occurs granular disseminated in anthophyllite. Colour olive-brown; streak greenish-brown. Fracture uneven, conchoidal. Hardness 7 to 8;0. Luster vitreous. Translucent. Specific gravity 3;42. Found at Akulke in Greenland. Analysis, by Stromeyer: Silica, 14;50; alumina, 7;11; magnesia, 16;85; lime, 0;28; oxide of iron, 3;92; oxide of manganese, 0;58; water, 0;49.
Specific gravity 6.2 to 6.4. Found at Lead-hills, in Scotland. Analysis, by Brooke: Carbonate of lead, 72.5; sulphate of lead, 27.5.

**STANNITE** (Barystannomolybdate). [SYNTHETIC, P. C.]

**TELLURIAN SPAR.** [WOLLASTONITE, P. C.]

**TELLURIBORITE** (Tellure of Bismuth). [TETRACUIUM, Ores of, P. C.]


**TETRAPHYLLITE** occurs crystalized and massive. Primary form a right rhombic prism. Massive variety has a closely lamellar or crystalline structure, with cleavages parallel to the planes of a right rhombic prism. Colour greenish grey. streak greyish white. Hardness 5-5. Translucent in thin pieces. Specific gravity 3.6. Found at Bodenmais in Bayern. Analysis: Phosphoric acid, 41.47; protopside of iron, 48.57; protopside of manganese, 4.70; lithia, 3.40; silica, 0.53; Anal.


**UMBASAITE** (Columbite Garnet) occurs crystalized in rhombohedral crystals. Colour emerald green. Hardness 7-7. Fracture transgranular. Specific gravity 3.81. Found at Beaserek, in the Urals mountains. Analysis, by Kornesien: Silica, 37.11; alumina, 5.88; oxide of chromiun, 29.94; protopside of iron 2.44; lime, 30.44; magnesia, 6.10; water, 0.91.

**VAUQUELINEITE**. [CHROMIUM, Ores of, P. C.]

**VILLASITE**. Primary form a rhombohed prism. Colour yellowish green. Fracture granular. Hardness 3-3 to 3.5. Brittle. Translucent to transparent. Specific gravity 3.11. Found in Spanish Cusco, Peru. Analysis, by Dufresnay: Silica, 36.61; magnesia, 43.37; protopside of iron, 3.39; protopside of manganese, 2.42; lime, 0.58; potash, 0.58; water, 5.30.

**VOLBOVOLITE** (Vanadinite of Copper) occurs in small clusters of olive-coloured crystals, sometimes united into globular masses. Streak green, almost yellow. In thin splinters, transparent, with a vitreous lustre. Hardness, scratches calcareous. Specific gravity 4.05. Found on examining some Siberian copper-ores. Von Volbort, who examined it, has not given an exact analysis.

**WOLFAITE** (Iron Alum) occurs crystalized in regular octahedrons. Colour bronze black. Found at the Solfatara near Naples. Analysis, by Dufresnay: Sulphuric acid, 45.67; protopside of iron, 28.69; alumina, 3.27; potash, 5.47; water, 17.30.

**WAGNERITE** (Fluoride of Titanium and Iron). Primary form an oblique rhombic prism. Fracture uneven. Colour yellow, or different shades; often greyish. Streak white. Hardness 5 to 5.5. Lustre vitreous. Translucent. Specific gravity 3.11. Found in the valley of Holgabren in Salzburg. Analysis, by Fuchs: Phosphoric acid, 41.73; hydrofluoric acid, 6.50; magnesia, 48.66; oxide of iron, 5.00; oxide of manganese, 0.5.

**WAGNERITE** (Fluoride of Titanium and Iron). Primary form an oblique rhombic prism. Cleavage parallel to the longer diagonal, perfect. Colour dark brown brown to iron grey, and often with a copper-red tinge on the face of perfect cleavage. Decomposing crystals are nearly iron black, with a faint tinge of purple. Fracture uneven. Hardness 5.5 to 6.0. Brittle. Lustre metallic-pearly on the cleavage surface; of other surfaces, vitreous or subvitreous, often nearly dull. Specific gravity 3.3 to 3.32. Found near Amity and Enderville, in the State of New York. Analysis, by Shipheard: Titanium, 64.71; iron, 2.14; yttrium, 0.80; fluorine, 27.33.

**WASHINGTOITE** (Lithianite). [TITANIUM, Ores of, P. C.]

**WILLMERITE** occurs in oblique rhombic prisms. Colour ash-grey or brownish. Presents only feeble traces of cleavage. Fracture even or coarse granular. Hardness, scratches glassy, by the unaided eye. Translucent to transparent. Specific gravity 2.60. Found at Fabien, Sweden. Analysis, by Wachtmeister: Silica, 58.69; alumina, 21.70; magnesia, 8.99; protopside of iron, 1.43; protopside of manganese, 0.63; potash, 4.10; soda, 0.68; oxide of zinc, 0.3; water, with a little ammonia, 3.20.

**WILLEMITE** [SCOFIELDITE, P. C.]

**WILLEMITE** occurs in angular grains, and in tabular crystals; form indeterminate. Cleavage distinct in one direction. Colour light yellow, wine-yellow, honey-yellow, brownish yellow. Streak yellowish white. Fracture more or less conchoidal, splintery. Hardness 2-2. Lustre vitreous. Subtranslucent. Transparent. Specific gravity 3.41. Found in an island near Brevig in Norway. Analysis, by Schercher: Silica, 30.62; columbic acid, 14.47; zirconia, 15.17; iron, 19.12; soda, 7.78; oxide of iron, 3.12; protopside of manganese, 1.55; magnesia, 0.40; water, 0.54.

**WORTHITE** occurs in rolled masses, having a foliated crastalline structure, and sometimes presenting very small apparently detached prisms. Colour white. Lustrous, metallic. Hardness 2-2. Lustre vitreous. Translucent. Specific gravity 3.1. Found near St. Petersburg, and on the shores of the Bay of Finland. Analysis, by Dr. Heuss: Silica, 40.79; alumina, 53.06; magnesia, 0.58; water, 4.68.


**YELLOW COPPER-ORIE (Copper Pyrites) occurs crystalized and massive. Fracture forms a square prism. Common form a tetrahedron. Fracture conchoidal. Colour brown yellow, frequently with a violet and purple tints on the surface. Streak greenish black. Lustre metallic. Hardness 2-4 to 4.5. Specific gravity 3.57. Found in Cornwall, and in most copper- mines. Analysis, by Rose: Copper, 33.12; iron, 30; sulphur, 36.59.

**YTBRODITE**. [YTTRIUM, P. C.]

**YTTRVANTHALITE**. [YTTRIUM, P. C.]

**ZAAGANITE** [PHILLIPSITE, P. C.]

**ZENITE.** [EPIDOTE, P. C.]


**MINES.** Mines are properly openings in the ground from which any thing is dug. Until an opening is made, the name is not properly applied, though the term is now generally used to signify coal, lead, iron and so forth, before an opening is made for digging out.

Mines belong to the tenant in fee-simple of the land, with the exception of gold and silver mines, which belong to the king by his prerogative, but by 1 W. & M. c. 80, a mine of copper or tin is not to be considered a royal mine, though silver be extracted from the ore. The owner of land in fee-simple is the owner of everything which lies in a perpendicu- lar direction under the surface to any depth. A tenant for life, unless his estate is without impeachment of waste, cannot dig earth, lime, clay or stone, except for the repair of buildings or the manuring of the land. In fact the general principle is that the land, which term comprehends everything in its or that is permanently attached to it, cannot be taken away by any other person than the tenant in fee- simple or a tenant in tail. Accordingly a tenant for life cannot open a new mine, but he may work mines which are already open, and he may open new shafts for working veins of coals which have been already worked. A tenant in tail has an estate of inheritance, and incident to it the power of commit- ting waste, as by cutting down timber or opening mines.

If a man who has a right to a mineral in fee-simple, open the mines upon it, the lessee is thereby empowered to dig for the minerals; and if he leases lands on which mines are already open, the leasees may work them.

The freehold interest of lands is vested in the lord, and it is a legal consequence that he has the freehold of the mines. In some cases a copyholder of inheritance has by the
custom of the manner a right to the timber, and the lord has no right to dig mines, unless there be a custom which gives him the right.

A partnership for working a mine is subject to the same legal rules as any other partnership. [PARTNERSHIP, P. C.]

MITCHELL, THOMAS, was born on the 30th of May, 1783, in London, and was the son of a riding-master. At the age of seven he was admitted into Christ's Hospital, where he remained until the year 1802, when he went to Pembroke College, Cambridge, on one of the exhibitions of the College. In 1806 he took his degree of B.A., and the distinguished manner in which he acquitted himself at college induced the governors of Christ's Hospital to present him with a handsome silver cup. He did not however obtain a fellowship, as he had hoped, for no more than two persons educated at the same school are allowed to hold fellowships in Pembroke College at the same time. This regulation, which was then made and carried into effect for the first time, deranged all Mitchell's schemes, who had determined to devote himself to philologous pursuits. A few years afterwards however he obtained a scholarship as a fellow of Pembroke College, Cambridge. Mitchell never married, and if he had taken holy orders he might have remained in the enjoyment of that fellowship for life, and would have added many more volumes to the Eddystone stone, after which he was afterwards exposed. But he never took orders from a fear of the great responsibilities of the pastoral office, and consequently, after a limited number of years, he was obliged by the statutes of the college to vacate his fellowship. He afterwards earned his livelihood by private tuition and by writing for the press; he was engaged for ten years as tutor in private families. In 1818 he commenced a series of essays for the Quarterly Review on Aristotle, and on Athenian manners, and this led him to translate some of the plays of Aristophanes into English verse; his translation appeared in 2 vols. 8vo., 1820-22. His articles in the 'Quarterly Review' impressed the patrons of a vacant Greek chair in one of the Scotch universities with so much respect for his classical attainments, that they invited him to accept the situation; but as he would have had to sign the Confession of the Scotch Kirk, which was to him an insurmountable obstacle, he declined the lucrative office, notwithstanding his poverty. During the last twenty years of his life Mitchell lived with some of his relations in the county of Oxford, and occasionally superintended the publication of some portion of the Greek works which he himself had time printed at the Clarendon press. During the years 1834-38 he edited, in separate volumes, five of the plays of Aristophanes, with English notes; and in 1839 he began an edition of Sophocles, likewise with English notes; but after the first three tragedies had appeared, the publication was suspended in 1842, because English notes were thought objectionable; and Mitchell now had no other employment but what the Clarendon press might casually offer. The almost entire cessation of literary income not only caused him great pecuniary difficulties, but broke down his health and spirits. His friends became alarmed about him, and made his condition known to Sir Robert Peel, who immediately placed at his disposal the sum of 150l. from the royal bounty fund. In 1848 the publication of Sophocles was resumed, and the remaining five of the Greek plays were like so many editions with briefer notes than the preceding three. In 1844 he undertook the publication of a minor edition of a 'Pentalogia Aristophanica,' with short Latin notes, and had nearly completed his task when he died suddenly, on the 5th of March, 1846, at his house at Steeple Aston near Woodstock. His health had long been in a weak state, but his death was unexpected.

The works which Mitchell edited and commented upon contain evidence that he was a Greek scholar of considerable eminence; but his notes are often irrelevant, and the text of his author is seized upon to furnish opportunities of showing his critical opinions and a passionate attachment to the Athenian democracy and democratic forms of government in general. [CLASSICAL MUSEUM, vol. iii, p. 213, 3rd.]

MITE. [ARABS, P. C.]

MITFORD, WILLIAM, the eldest son of John Mitford, Esq., of Exbury in Hampshire, was born in London on the 10th of February, 1744. In his boyhood he spent some time at Oxford, kept at Chesham by an unknown Mr. Gilpin, who afterwards owed to him the living of Bolder. Ill health caused his removal from school about the age of fifteen; and it seems to have been with very insufficient punishment that he became a student in Pembroke Col- lage, Oxford. His time at the university was idly spent; and he left it without taking a degree. Perhaps the most im- portant influence exercised on his mind by his academical residence was derived from the romantic stories, and the adventures of adventure stories, and the adventures of adventure stories, of which he seems to have been particularly fond, and which he attended regularly. He studied law for a time in the Middle Temple, but found the study distasteful; and, having succeeded to the family estate in 1761, on his father's death, he at once abandoned the unprofitable profession, and went to the Continent. In 1766 Mr. Mitford married; and for seven years afterwards his time was chiefly spent in the retirement of his country-seat, where his early predilection for the Greek language and literature grew into a settled passion. In 1769 he became a captain in the South Hampshire militia, of which the historian Gibbon was then major; and the conversation and advice of Gibbon confirmed, if they did not prompt, his resolution to undertake a history of Greece. His first work, 'An Inquiry into the Principles of Harmony in Languages, and of the Mechanism of Verse, Modern and Ancient,' appeared in 1774, and was immediately followed by a translation of the 'Odyssey,' which he published in 1777. In 1778 he published 'A Treatise on the Military Force, and particularly the Militia, of this Kingdom.' In 1779 he lost his wife, and was himself seized with a dangerous illness, on recovery of which he was created a baronet from whose honours he never receded. Before leaving home he had become acquainted with the French scholars Voltaire and De Meusnier: the former introduced him to the Baron de Sainte Croix; and his intercourse with those two young students matured his own literary ambition. On his return home, however, he allowed public duties to claim frequent precedence. He acted as a county magistrate, and in 1778 was appointed Verderer of the New Forest. But notwithstanding his attachment to Gibbon was seduced to Gibbon's lieutenant-colonelcy in 1779, and in 1805 was appointed to the colonelcy, which he resigned in the course of the next year. From 1785 till 1790 he sat in the House of Commons as member for Newport in Cornwall; from 1796 till 1806 he represented Brearleton, a nomination borough of his maternal kinsman the Duke of Northumberland; and from 1812 till 1818 he was member for New Romney. His parliamentary appearances were confined to two or three speeches on the militia laws. In 1802 he succeeded, through his mother, to the Revelsy estates in Yorkshire. But his paternal estate on the borders of the New Forest was tenanted by the Mitford baronetcy residence. He died there on the 8th of February, 1827. His 'History of Greece' was written and published in successive portions under the dates of the first volume, being the following: vol. i., 1784 (second edition, 1790); vol. ii., 1786; vol. iii., 1797; vol. iv., 1808, and vol. v., 1818. It closes with the death of Alexander the Great; and the author, enfeebled by age and partly blind, was unable to execute his intention of continuing it to the subjugation of Greece by the Romans. In 1815 appeared an octavo edition of the volumes which had previously been published; and in 1829 there appeared a new edition of the whole work, in eight octavo volumes (since reprinted), with an introduction by his brother, Lord Redesdale, furnishing some particulars of the author's life, but chiefly taken up in vindicating the political opinions expressed in his 'History.' In 1829 appeared 'Mitford's History of the war between the Greeks and Philip of Macedonia. Philip is with him a perfect king, hero, and statesman. Demosthenes is a dishonest and malignant demagogue, and the Athenians are a contemptible and democracy miscreants. The works of the author have not been surpassed or matched by any modern or ancient historian. He has elucidated with remarkable success the state of political parties in some events. His political and personal views are lost in the general interest and partisanship which animates his mind. His work has not been neglected, but there is not a more accurate or more respectful view of many particular events. He has been led to these results mainly by his severely critical nature of estimating the antiquities, and by his systematic manner to gain his knowledge from contemporary sources.
secretes. Accordingly his history will always be valuable to the classical student, notwithstanding the bias above noticed, and in spite also of its deficiency both in philosophical reflection and in animation of narrative. In style indeed the work is a failure, as it is the regrettable fact that the last edition have removed only the least of the technical faults, the perverse affectation of the orthography. A treatise on the religions of Antient Greece and Rome, which he published late in life, in a small octavo volume, was regarded by him as a supplement to his History, and would probably have formed a part of it had he been able to complete his original design.

MODELLING. Modelling in clay is so completely a practical art, and depends so much on the experience and formative skill of the modeller, that beyond a few remarks on the necessary consistancy of the clay, nothing more can be given here than an account of the nature and uses of the tools, and some description of the sculptor’s process.

The tools, called modelling tools, are made of wood and wire, but no tool is more useful than the finger; indeed tools have been invented as mere aids to the fingers, and are designed only to do what they cannot perform. Wire tools are the most useful, being fashioned into lumps of various shapes and sizes, round and angular, and fixed into wooden handles. They vary not in their form, but drive the clay on to any already modelled part, the superfusious clay remaining in its place while the wire passes under it and until the tool is removed, when it either falls of its own weight, or is chiseled off. The skeleton of this modelling is created by the tools.

The wire tools are most efficient when applied to concave surfaces, especially those in the close or narrow folds of draperies: the wire is sometimes notched or indented, to give a rougher manner of application. Materials are made of box and ebony, of various shapes and sizes—curved, straight, pointed, rounded, and flat and broad; the broad tools being notchted, and designed chiefly for working the large convex masses of the figure. The drapery supports must be thick, for often the features, great nicety is required, and the modeller must be particularly careful not to injure what is already done, by retouching with the tool while clay is adhering to it, or be made ragged. The edges of the clay adhering clay will drive up the surface. A good method to guard against this accident is to keep the wooden tools which are used for the finer work soaked in oil; the clay is then not liable to adhere, and much time is accordingly saved in finishing the model. The above is perhaps, without practical demonstration, all that can be usefully said about the working tools.

The clay used is common potters’ clay, but should be of the best quality. It must be so wet that it will not stand in a mass much thicker than its own width without support. The clay adheres much more to the tools when wet, but it is at the same time hard to work, and under such circumstances the matter of great consequence, as the patience of the artist is less tried, and some expenditure of time is saved. The supports for the clay are a most important consideration, for if not of suitable nature, clay, even the finest, after a month’s or months’ labour, might suddenly fall to pieces by its own weight. This accident happened to Don José Alvarez, a celebrated Spanish sculptor, while at Paris. He modelled, about the year 1805, a colossal statue of Achilles receiving the fatal arrow into his heel, which, owing to the insufficient support of the clay, fell to pieces shortly after it was finished: it was much admired by the connoisseurs of Paris, but Alvarez had no courage, or wanted opportunity, to restore it.

This accident might certainly have been prevented by proper attention to the supports of the clay while the model was in progress, for though in large models this is a work of great care and labour, it is always practicable. The support of a figure of the heroic or ordinary size (seven feet) is comparatively easy, but this also exacts strict attention, especially if in any very active or unusual attitude. Sculptors generally model figures of the ordinary size upon a bench or stand called a banker, about thirty inches high, and about thirty inches square,—for a bust must of course be much higher; above this a solid circular plinth is fixed on a wooden box, and supports for any parts; and it is necessary to have two short slightly conical rollers, fixed to the plinth near the circumference: the plinth moves more easily on such rollers than wheels, and the rollers afford a more solid support and last much longer than diminutive ones. A banker should be so that the sculptor to see his work on all sides in any light, and it enables him to work on all parts, in one spot, or in the same light. On the centre of the plinth there must be fixed vertically a strong iron bar, about the height of a man, and from about six to ten inches in circumference, according to the weight of the figure; it must necessarily be strong and firmly fixed in the sand, to prevent the whole skeleton of supports. In loosely draped figures, which are particularly those which have the feet to fix a vertical beam of wood to the main iron bar; for though the bar will keep the clay perpendicularly in its place, it is no provision against the weight of a great mass; and the quantity used in some figures, even a moderate heroic figureases, or even a heroic male figure, the only amounts to about two tons. Two cross pieces of wood must be fixed to the main bar at the shoulders and the loins, from which the supports of the arms may be arched; and a third piece may be fixed in the middle to diminish the weight of clay; the supports of the legs must be bars, straight or bent, according to the position of the legs; but the supports of the arms, when not detached from the body or drapery, may generally be made of twisted thick corks, small pieces of wood being twisted in with it at short intervals and at right angles, like the pieces of paper in the tail of a boy’s kite. The fingers, if separated, will require surgical care; indeed the clay should be gradually built up against a complete skeleton of supports, and sufficiently strong not to yield in the least to the weight of the clay when the model is of this kind. In small fragments, the heroic size is often the work of a week or more, and it would be always advisable for the young sculptor, in modelling his first figure, to procure some experienced hand to construct it. If it be small, and the piece has to be detached and detached from the figure, the support might be so contrived as to allow the arm to be removed at pleasure, which would enable the sculptor to model the part beneath it more easily, and also to avoid the risk of injury to the arm. The contrivance is easily accomplished, for nothing more is required than a pipe or tube in the shoulder support, which could receive and hold firmly the arm, or large piece of wood, or metal; or merely thick or twisted wire, when of a small size. In modelling a bust very little support is necessary, an upright piece of wood with a cross bar at the shoulders being quite sufficient; but a small cross bar at the head would do no harm.

Another essential part of modelling is preserving the moisture of the clay, which should be always uniform if possible; it must never be allowed to dry, and it can be kept moist with very little trouble. While the modeller is at work, and the figure is exposed, especially in warm weather, he should repeatedly sprinkle it with water. A plasterer’s brush is the best instrument for this purpose, and much superior to a syringe or the mouth, which some sculptors formerly used to apply as a squat, even in the presence of their sitter, while modelling a bust: Nollekens, according to his biographer, said that it was a great mistake to use a syringe while modelling the bust of George III, and in the king’s presence. Bacon, on a similar occasion, used a silver syringe.

At night time, or when the artist is not at work on the model, it must be covered, but with a wet cover; the clay may be kept moist for a long period without adding water, provided the air be kept away from it; this may be done by an oil-silk or any air-proof bag, which can be made fast to the plinth of the banker by clay. Sculptors generally model flowing draperies from lay-figures. When the model is complete, the next process is to take the cast, to work the marble from, or to make other casts from. The whole model, while wet, must be covered, in two or three masses, or more if necessary, with plaster of Paris; when this is fixed and dry, the whole may be separated at the joints, without any regard to the preservation of the model, for when the mould is taken the model is no longer of any value. When the clay is completely removed from the mould, the component parts of the mould must be again put together, and in the place of the original clay it must be filled with plaster of Paris, and when the cast is well set, the mould may be broken up into fragments, and the cast is exposed, and complete, the finished work. If casts of it are required, a new working mould, or safe mould, as it is termed, must be taken, in which the model is exacted by water. The mould is then copied by the carvers, with the assistance of the point cutting machine, of which the most complete is that invented and used by W. C. Marshall, A.R.A. It is so contrived that it can be detached from the model in a very short time, with ease and nicety. It is always best to make the model of the size of the intended figure if practicable, because any error in
a small mode becomes multiplied in a larger one in proportion to the difference of size. Flaxman was in the habit of making small models, and he had in consequence sometimes immense labour to go through to diminish errors in the full-sized marble work: it is hardly possible to completely rectify these.

The antient sculptors used to bake their models, but this is not so good a plan as making plaster casts from them, though less troublesome and much cheaper: the clay in drying shrinks, and is apt to crack, and certainly never comes out of the oven the same shape that it was when put into it, or at least when originally modelled. These baked models are called terra-cotta (baked earth) figures, are extremely numerous, and are generally of small dimensions, but there are a few of a large size in various European museums. There are four at Naples which were found at Pompell; and the inferiority of these works is some proof of the advantage of the modern method of taking plaster casts from the models over the antient system of making them, for the errors in the proportions of these works are probably to a great extent due to the shrinking of the clay in the oven. The antients made also moulds of clay, which they likewise baked, and they formed their casts by the pressure of clay into these: this practice of pressing clay, or any malleable substance, into a mould is still occasionally found in some crude art, and is constantly in the potteries, and by frame-makers.

The antients used also wax for casting and in forming their models, especially those of the small bronzes, which are still so extremely rare, and the materials of which are goldsmiths and medallists. Modelling wax is prepared by melting virgin wax with a very small quantity of Venice turpentine and flake-white in fine powder: if coloured wax is required it is compounded with powdered colours, and melted with flake-white. The tools used in modelling in wax are made of wood and ivory, and have the same shapes as those of wood, already spoken of, for modelling in clay. Other processes in the art are sculpture of clay, being found in the articles BRONZE; FOUNDING; SCULPTURE, P. C.; and WAX MODELLING, P. C. S.

MODENA or MUTINA, TOMMASO DA, a painter of the fifteenth century, who has been described by some German writers, without any better foundation than the possession of some of his works, for Bohemia. He appears to have been at Prague in the time of the Emperor Charles IV., who was a patron of the arts, but it is also quite possible that the emperor bespoke the works in his possession of the painter at Modena. The name of Tommaso da Modena is no more important than it otherwise would have been on account of various pretensions which his works have given rise to. The altar-piece, in three compartments, of the Virgin and Child, with Saints Wenceslas and Palmatius, patrons of Bohemia, formerly at Carlstein, but now in the gallery of the Praga, was said to be by Von Mechel's catalogue, to have been painted in 1297; it was therefore eagerly sought after by writers of German and Italy, to confuse Vasari, to vindicate the title of their respective countrymen to the possession of the picture however bears no date, and more recent chemical analysis has shown that it is a tempera, and not an oil painting. The figures are half-length, about half the size of life, and are painted upon a gold ground; and the picture bears the following inscription:

Quis opus hoc factus? Thomas de Mutina piantis, Quale vide locate Barisini illius socior.

Von Mechel read Barisini, but some documents mentioned by Federici, Tiraboschi, and Lanzi show that Barisini should be the reading; Barisini being the name of Tommaso's father, and his own full name accordingly Tommaso da Barisino da Modena.

There is an extensive work, a series of many portraits, in the chapter-house of the Dominicans at Trevigi, which Fra Federici, a Dominician, has had engraved for his account of the antiquities of Trevigi—Memorie Trevigliane le Ope de Disegno.' They were painted in 1593, and are accompanied by the following inscription—Anno Domini MCCCLX. Fru Federici ordinis prepositus devoti ergo statuit Capitulum, et Thomam Pictor de Mutina pinit istud. These works are complete in the style of their time, but rather above the standard than otherwise.

BERENDUS, a Roman classical jurist, was apparently a pupil of Ulpian. He lived under the Emperor Alexander Severus, and was one of his legal ad-

visers (consiliarii); he also taught law to the younger Maximin (Jul. Capitol., Maximin. Jun. 1). Modestinsus often cites Ulpianus and Paulus. The Florentine Index enumerates the following works of Modestinsus: nineteen books of Excussiones, seven books of Excussiones, seven books of Poenae, and seven books of Differentiae. Six works of Excussiones, four books of Noemae. The work on Excussiones was written in Greek (Dig. 27, tit. 1, De Excussionibus). Nine other works of Modestinsus, in single books, are enumerated in the Florentine Index. The period of Modestinsus is also determined by an inscription, which contains the judgment in a suit which was prosecuted some time between 5037 and 5041. The inscription was first printed by Fabretti, in his work on Inscriptions (p. 278). Modestinsus is mentioned in a rescript, of the year a.d. 289, of the Emperor Gordianus. There are 345 excerpts from Modestinsus in the Digest.

The compilers of the Digest have made a few excerpts from two writers posterior to Modestinsus. These writers are Hermogenianus and Aurelius Arcadius Charisius. Modestinsus is cited by Charisius (Digest, 50, tit. 4, a. 18).

MODUS. (Thes. P. C.)

MOEHRINGIA, a genus of plants named after Paul Henry Gerhard Moehring, a German physician, author of 'Horus Himongen,' and other works on botany. It belongs to the natural order Caryophyllaceae, and has 5 sepals, 4 or 5 petals, either entire or slightly emarginate; 8 to 10 stamens, 2 or 3 styles, the capsule opening with 4 or 6 valves; the seeds numerous, rough; the plants annual. The species are alpine plants with the habitat of Arenaria. M. trinitis has ovate acute stalked 3-5-nerved leaves, the upper ones sessile, the petals shorter than the calyx, the styles longer than the stamens; found in the Alps of South Germany. Four other species of this genus are described by Koch in his 'Flora Germanica':—

M. maculosa, M. proca, M. polygonoides, and M. villosa.

The species are alpine plants, and adapted for cultivation on rockworks, being best grown in pots, by dividing them at the root. They are best grown in pots, in a mixture of sand, loam, and peat.

(Debogin's Manual; Don, Gardener's Dictionary.)

MOECHA, a genus of plants named after Conrad Moehnc, professor of botany at Marburg, who wrote several works on botany; amongst others, 'Enumeratio Plantarum Indigenarum Basii, presertim inferioris,' Cassel, 1777, 5vo.; also a work on the cultivation of North American forest-trees in Germany.

The genus Moenchia belongs to the natural order Caryophyllaceae, and has 4 erect sepals, 4 entire petals, 4 stamens, and a many-seeded ovary. It is a small glaucous plant growing in dry gravelly and sandy places.

(Debogin's Manual.)

MOI, or MOITE, or ARNAUD GUILLAUME, Chevalier, the son of the engraver P. E. Moitte, was a distinguished French sculptor, and was born at Paris, in 1747. He was first the pupil of Figal, after whose death he studied under Lemoine. In 1768 he obtained the grand prize in sculpture for a statue of David carrying the head of Goliath, and he went, as entitled in consequence, to complete his studies at the French Academy at Rome; the Roman climate however proved quite unfit for his constitution, and he was forced to return to Paris.

Motte has executed many excellent bas-reliefs and figures, and some equestrian statues; but he left many models, and among them his principal works, unfinished at his death, as the great bas-relief for the column of Boulogne, and the equestrian statue of General d'Hautpoul, a model in plaster, made for the French government. Moitte was a member of the old French Academy of Painting and Sculpture, and afterwards of the Institute of France, and a Chevalier of the Legion d'Honneur. He died in 1810.

The following are some of his principal works:—A marble statue of Cassini; another of General Custines; a baso-relief for the church of St. Vincent; a large relief for the church of St. Martin. He was also a pupil of Vassilievo in the court of the Lorraine, representing History in

scribing 'An VI. and the name of Napoleon with his French

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MOLNY, a genus of grasses belonging to the tribe Festucceae. It has unequal glumes without lateral ribs, shorter than the lanceolate and pointed lemma, and a subulate rudiment of another. The palea hardening on the loose fruit, and the style terminal. There is one species which is British—

*M. oreades*, which has an erect elongate narrow panicle, spikelets from 1- to 3-flowered; the outer pales rarely 5-nerved, downy, the upper part of the stem naked. The leaves are long, linear, and alternated. It grows on wet heaths in alpine situations. This species is the *M. deperdaurus* of Lindley.

(Babington, Manual of British Botany.)

MOLY, PIETER. [Tamusfera, P. C. S.]

MOLYNA, GRASS, *P. C. S.*

MONCREIF, SIR HENRY, a divine, and ecclesiastical leader in the church of Scotland, was born at Blackford, in Perthshire, on the 8th of February, 1760. His father Sir William Moncreif, was a prominent member for one another quarter of a century before the baronetcy by the failure of the elder line, when he was minister of Blackford, in 1744. Sir Henry was the sixth of his family that had belonged to the clerical profession. He studied at St. Andrew's College, and was ordained a minister on the 16th of August, 1771. Though he was probably the only man of rank who ministered in the church of Scotland, he was as strongly imbued with the spirit of the Presbyterian policy as those, by far the most numerous class in that church, whom the profession was the means of raising from the more humble grades of society. He had a commanding appearance, was gifted with a powerful argumentative faculty, of a kind of wit, and learned and with such advantages, personal and social, he naturally occupied the first rank in the church. He was for some time his father's successor as minister of Blackford, and in 1775 he was appointed to the charge of St. Cuthbert's, in Edinburgh, where he remained till his death on the 14th of June, 1837. He was frequently moderator of the General Assembly, and his name was conspicuous in nearly all the ecclesiastical discussions connected with the church of Scotland during his minister in Edinburgh. He was the author of many pamphlets connected with these questions. In 1815 he published 'Discourses on the Evidence of the Jewish and Christian Revelations, with Notes and a Preface, by the Rev. John. S. Elliott.' Also 12,000 lines entitled "Writings of Dr. John Erskine." [ERKINE, JOHN, P. C. S.]

MONESES (from μονή, sole, or alone), a genus of plants belonging to the natural order Ericaceae and the tribe Pyrole. It has 6-toothed calyx; 5-lobed corolla; 10 inclined stamens; the anthers dehiscing at the base by two holes, the cells elongated and tubular; the stigma 6-toothed; the capsule 6-celled; the valves dehiscing from the apex, destiné to toothment. There is but one species of this genus, *M. grandiflora.* It has a creeping root; large solitary terminal drooping open white flowers, nearly an inch broad; very large stigmas. It is a native of Europe, Asia, and North America, in Alpine moor and woods. It is found in Great Britain, in the mountainous woods of Scotland. It may be cultivated in the same manner as the species of *Pyrola.* [WINTERGREEN, P. C. S.]

MONEY is the medium of exchange by which the value of commodities is estimated, and is at once the representative and equivalent of such value. Barter is naturally the first form in which any commodities can be exchanged. Exchanges of the one by the other, is equal, and the same article than he requires for his own use, exchanges a part of it for some other article which he desires to possess. But this simple form of exchange is adapted to a rude state of society only, where the objects of exchange are not numerous, and where their value has not been ascertained with precision. As soon as the relations of civilized life are established in a community, some medium of exchange becomes necessary. Objects of every variety are bought and sold, the production of which requires various amounts of labour; these at different times are relatively abundant or scarce; labour is bargained for as well as its products; and at length the exchangeable value of things, related to labour, is distinctly defined, and needs some common standard or measure by which it may be expressed or known. It is not sufficient to know that a given quantity of corn will exchange for a given quantity of a commodity; for, their value is always the same; but if a standard is established by which each can be measured, their relative value can always be ascertained as well as their positive value, independently of each other.

As a measure of value only money is thus a most important auxiliary of commerce. One commodity from its nature must be measured by its weight, another by its length, a third by its cubic contents, others by their number. The diversity of their nature, therefore, makes it impossible to apply one description of measure to their several quantities; but the denomination of the value of each may be measured by one standard common to all. Until such a standard has been agreed upon, the difficulties of any extensive commerce are insurmountable. One man may have nothing but corn to offer for other commodities, the owners of which have somewhat of a different quantity of corn which would be equivalent for their respective goods. To effect an exchange these parties would either have to guess what quantity of each kind of goods might justly be exchanged for an equivalent of 10 bushels of corn, or one another, which proceeded to the baronetcy by the failure of the elder line, when he was minister of Blackford, in 1744. Sir Henry was the sixth of his family that had belonged to the clerical profession. He studied at St. Andrew's College, and was ordained a minister on the 16th of August, 1771. Though he was probably the only man of rank who ministered in the church of Scotland, he was as strongly imbued with the spirit of the Presbyterian policy as those, by far the most numerous class in that church, whom the profession was the means of raising from the more humble grades of society. He had a commanding appearance, was gifted with a powerful argumentative faculty, of a kind of wit, and learned and with such advantages, personal and social, he naturally occupied the first rank in the church. He was for some time his father's successor as minister of Blackford, and in 1775 he was appointed to the charge of St. Cuthbert's, in Edinburgh, where he remained till his death on the 14th of June, 1837. He was frequently moderator of the General Assembly, and his name was conspicuous in nearly all the ecclesiastical discussions connected with the church of Scotland during his minister in Edinburgh. He was the author of many pamphlets connected with these questions. In 1815 he published 'Discourses on the Evidence of the Jewish and Christian Revelations, with Notes and a Preface, by the Rev. John. S. Elliott.' Also 12,000 lines entitled "Writings of Dr. John Erskine." [ERKINE, JOHN, P. C. S.]

HIS Sermons, of which there had been some separate publications during his life, were collectively published after his death by scholar with such advantages, personal and social, he naturally occupied the first rank in the church. He was for some time his father's successor as minister of Blackford, and in 1775 he was appointed to the charge of St. Cuthbert's, in Edinburgh, where he remained till his death on the 14th of June, 1837. He was frequently moderator of the General Assembly, and his name was conspicuous in nearly all the ecclesiastical discussions connected with the church of Scotland during his minister in Edinburgh. He was the author of many pamphlets connected with these questions. In 1815 he published 'Discourses on the Evidence of the Jewish and Christian Revelations, with Notes and a Preface, by the Rev. John. S. Elliott.' Also 12,000 lines entitled "Writings of Dr. John Erskine." [ERKINE, JOHN, P. C. S.]
barter gives place to commerce. But what must be the qualities of a medium? Are all commodities used in a barter and its products of their own labour? Is it now no longer like a weight or measure, the mere instrument for assessing the value of commodities; but, to use the words of Locke, ‘it is the standard of value’? It is the measure of the largeness of the largeness of the larger. A bargain is complete when money has been paid for goods; it has no reference to the price of other goods, nor to any circumstance whatever. One party parts with his goods, the other pays his money as an absolute equivalent. But though money as a medium of exchange thus differs from money as a mere standard of value yet in both characters it should possess, if it be possible, one quality above all others—an invariable equality of value, applicable at all times and in all circumstances. As a measure of value it is essential that it should always be the same, as that a yard should always be of the same length. And unless, as a medium of exchange, its value be always the same, all bargains are disturbed. He who gives his labour or his goods to another in exchange for a delusive denomination of value instead of for a full equivalent which he expects to receive, is as much defrauded as one who should bargain for a yard of cloth and receive short measure.

But however desirable may be the invarableness of money, complete uniformity of value is an impossibility. There is no character which would be disturbed. All descriptions of measurements correspond with absolute qualities, such as length, weight, and number, and may be invariable. But as value is a relative and not an absolute quality, it can have no invariable measurements between money and commodities. The value of all commodities is continually changing; some more and some less than others. Their real value depends upon the quantity of labour expended upon them; but temporary variations in their exchangeable value are caused by abundance or scarcity—by the relations which subsist between supply and demand. No commodity yet discovered is exempt from the laws which affect all others. If precisely the same quantity of labour were required for a long series of years to produce equal quantities of all commodities, its real value would remain unchanged; but if it were at the same time an object of demand amongst men, variations in the proportion between its supply and the demand for it would affect its exchangeable value. It follows therefore, that to be an invariable standard, money must always be produced by the same amount of labour, and in such quantities as shall constantly bear the same proportion to the demand for it.

But even if any description of money could be invented which possessed these extraordinary qualities, the value of all other articles would still be variable, and thus its representa- tive character would be disturbed. At one time, for example, a given denomination of money would represent a certain number of bushels of wheat; at another time, the same money, unchanged in real value or in demand, would represent a much greater quantity. The supply of money, a by-product of skill and of experience of mankind, facilitates production, and by saving labour reduces the real value of commodities. Their value is also liable to temporary depreciation, as happens whenever a foreign article, for instance, is imported upon an insufficient demand. But if money maintain the same value, in relation to itself, notwithstanding the diminished value of other articles, its proportionate value is practically increasing. The consequences of a growing disproportion between the representative value of money and the value of commodities are these: 1st, a producer has to give a larger quantity of his goods than before for the same amount of money; 2dly, those who are entitled to payments in money, receive the value of a greater quantity of commodities than they would have received if the relative value of money and commodities were of the same magnitude. In these circumstances, that, as a general rule, all creditors whose debts have been calculated in money derive advantage from any increase in its value relatively to commodities; while debtors benefit from any circumstance which raises the value of commodities as compared with that of money, whether it be by increasing the value of the former, or by depreciating the value of the latter. To make these principles clear, it must be supposed that a handsome farmer, who has considerable standing crops of wheat, has entered into a contract with his landlord, that the value of money has been relatively increased. In order to pay his rent, he must now sell a larger proportion of his produce, even though its gross production has not increased. Or a manufacturer, on the other hand, his landlord receives the same money rent, but is able to purchase more commodities than before on account of the increased comparative value of money.

Thus far we have been content to confine ourselves to the abstract qualities and uses of money, and to explain such general principles only as are introductory to the consideration of particular kinds of money, and of the modes of using and regulating them.

In all ages of the world, and in nearly all countries, me- tals seem to have been used, as it were by common consent, to serve the purposes of money. It is true that other articles have also been used for this purpose, such as shells among certain highly civilized nations, and cowrie shells in the less civil- ized parts of Africa; but in all such portion of the currency has been and is composed of metals. We read of metals amongst the Jews, the Chinese, the Egyptians, the Persians, the Greeks, the Romans. In the earliest annals of commerce they are spoken of as objects of value and of exchange; and wherever commerce is carried on there they are still used as money. But as they were introduced for this purpose in very remote times, it is not probable that they were selected because their value was supposed to be less variable than that of other com- modities. More than two thousand years ago, indeed, Aries- totle saw the limits of the use of silver and of gold, and he thought that the principal use of metallic money was that its value was less fluctuating than that of most other substances (Eth. Nicom. v. 6). But however clearly this great philosopher may have observed the general tendency of the circulation of metals, he could not have predicted the circulation of metals, those who first used them were men engaged in common barter, who considered their own conveni- ence and security without reference to any general objects of public utility. They must have used metals not as a standard of value, but as an article of exchange, which facilitated their barter. All metals are of great utility and have always been sought with eagerness for various purposes of use and ornament; but they were not used as money until their use was facilitated by the circulation of metals, which first engaged them in common barter.

Their comparative scarcity, the difficulty and labour of procuring them, their extraordinary beauty, their singular purity, their adaptation to purposes of art, of luxury, and display; their durability and compactness; must all have contributed to render them most suitable objects of exchange. They were easily conveyed from place to place; a small quantity would obtain large supplies of other articles; they were cer- tain to find a market; none would refuse to accept articles in payment which they could immediately transfer to others; and thus gold and silver naturally became articles of com- merce, readily exchangeable for all other articles, before they were considered as money, and were acknowledged as such by law and custom.

The transition of the precious metals from the condition of mere articles of exchange, amongst many others, to that of a recognized standard of value, is a by-product of certain conditions of skill and of experience of mankind, facilitates production, and by saving labour reduces the real value of commodities. Their value is also liable to temporary depreciation, as happens whenever a foreign article, for instance, is imported upon an insufficient demand. But if money maintain the same value, in relation to itself, notwithstanding the diminished value of other articles, its proportionate value is practically increasing. The consequences of a growing disproportion between the representative value of money and the value of commodities are these: 1st, a producer has to give a larger quantity of his goods than before for the same amount of money; 2dly, those who are entitled to payments in money, receive the value of a greater quantity of commodities than they would have received if the relative value of money and commodities were of the same magnitude. In these circumstances, that, as a general rule, all creditors whose debts have been calculated in money derive advantage from any increase in its value relatively to commodities; while debtors benefit from any circumstance which raises the value of commodities as compared with that of money, whether it be by increasing the value of the former, or by depreciating the value of the latter. To make these principles clear, it must be supposed that a handsome farmer, who has considerable standing crops of wheat, has entered into a contract with his landlord, that the value of money has been relatively increased. In order to pay his rent, he must

...
they distinguishable in character from any other articles of exchange. They were weighed, and being of the required fineness, a given weight was known as a denomination of value, but in the same manner only as the value of a bushel of wheat may be known. In the earliest ages gold and silver seem to have been internally exchangeable, and valued by weight and fineness only. The same custom exists at the present day in China. There is no silver coinage, but the smallest payments, if not made in the copper tokens, are effected by exact weighing always the same amount liable to permanent alterations, and also to occasional fluctuation.

Both gold and silver are alike subject to these general laws, and are therefore imperfect standards of value. If one be the standard independence of the other, being by itself, and also in its relation to other commodities; if both be adopted as standards at the same time, they will not only vary in themselves, and in relation to other commodities, but they will vary also in regard to each other. And thus another element of uncertainty is introduced into the coinage, which becomes still more imperfect as a standard.

But it is not customary for the state to allow coins to fluctuate in their legal value according to the circumstances which determine the market prices of gold and silver. Coinage does not merely authenticate the weight and fineness of a piece of metal, but is also intended for the same purpose for other commodities; but it attaches to it a definite value by fixing the standard price of the metal as well as the weight and fineness of the coin. The object of this regulation is to maintain the standard of value, and to prevent any small fluctuations in the value of the precious metals, it will generally have that effect. But if any considerable disproportion should arise between the standard price of bullion and the market price of the coin, a change in the standard will necessarily take place. If the market price should become considerably higher than the standard price, the coins would be melted down for the sake of the profit arising from the difference. If it should become considerably lower for any length of time, the value of the coin, though nominally unchanged, would in fact be depreciated; for they would exchange for a less quantity of other commodities than they exchanged before, and thus a currency composed exclusively of metals cannot be made an accurate standard of value by any expedients of law.

We may here remark however, that a seignorage, or charge by government to cover the expenses of coinage, acts as a protection, within certain limits, against the melting of coins, because unless their value be depreciated by over-issue, the whole charge will be added to their value as coins, and will be lost when they are melted. For amongst other reasons a seignorage should always be charged by the state.

There is yet another imperfection in coins as standards of value. Notwithstanding their natural durability, they are subject to continued and frequent depreciation in value. They are also exposed to the fraudulent exertions of men whose trade it is to rob them of a portion of their weight by artificial wear. The value of coins is therefore naturally reduced by the loss of weight, apart from any other causes of variation.

From all these circumstances it is evident that gold and silver coins have qualities inherent in them which render them necessarily imperfect standards of value, with whatever care and skill they may be regulated. But, in addition to these natural causes of imperfection, others have been artificially produced by erroneous or dishonest political expedients. There is no country perhaps in which the coinage has never been debased by the government. Debasement of coins was formerly a common artifice for increasing the revenue of states, and it has been effected in three different ways:—1, by diminishing the weight of the gold and silver coins; 2, raising their nominal value and ordaining that they shall pass current at a higher rate; and, 3, by debasing the metal itself. Of these the latter is the most general, and the most effective, since it has not only reduced the quantity of pure metal and increasing the quantity of alloy. In all these ways the coins of England have been debased at different periods; and it was the great experiment to which they were subjected by the late ministry, that from the Conquest to the reign of Queen Elizabeth the total debasements of the silver coins have been estimated at 14 shillings per cent. (Clifford, 1816, vol. i. p. 86.) By expedients of an opposite character the standard of coinage was raised, and the result of measures connected with the coinage of this country was, that in a period of 116
years, from the 1st James I. to the 1st George I., the value of gold coins, as compared with silver coins, was raised 39 per cent. (Ibid., p. 84.) No further examples are needed to prove the inconstancy of coins as a standard, when they form the value of gold.

But notwithstanding these imperfections, the convenience of gold or silver coinage, as money, has led to the universal adoption of one or the other, or of both conjointly, as the standard of value. The objections to a double standard have already been noticed; but throughout a long period of the history of this country we find gold and silver prevailing equally as standards. There appears to have been no public coinage of gold at the royal mints prior to the 41st Henry III. The gold pennies coined at that time were expressly declared not to be a legal tender, and never obtained a very general circulation. Silver was then the universal medium of exchange, and the people were unacustomed to the use of gold as money: but as their commerce and riches increased gold naturally became more convenient for large payments. The results of this progress became apparent in the reign of Edward I., who established a general circulation of gold coins, which, though partially introduced nearly a hundred years before, by Henry III., had not been continued by his successors. From this time gold and silver coins circulated together with legal tenders. To what an extent their relative value varied at different periods, has already been noticed; but they were equally recognised by law as authorised standards of value in all payments whatever, until the 53d Geo. III. c. 42 that, in future, silver coins should not be a legal tender in payment of any sum exceeding 25l., except according to their value by weight, at the rate of 5s. 2d. an ounce. This was temporary; but by what manner or means; several statutes until the year 1816, when the legal tender of silver coins was further restricted to payments not exceeding forty shillings (56 Geo. III. c. 69). And thus, as all large payments were made and calculated in gold coins, they became the sole standard of value, so far as coinage alone was the real medium of exchange.

The expediency of adopting gold as the standard instead of silver, has been the subject of much talk and controversy amongst the highest authorities upon monetary affairs. It was the opinion of Locke, of Harris, and Sir William Petty (all great authorities) that silver was the general money of account in England, and the measure of value in its commercial dealings with other countries. Its general adoption for such purposes was urged as a proof of its superiority as money over gold; and of this opinion are many thinkers of high authority; at the present day. On the other hand it has been argued, that the metal of which the chief medium of exchange is fabricated, should have reference to the wealth and commerce of the country for which it is intended; that copper or silver coins cannot be considered the cheapest means for the convenience of a very poor country; but that as a country advances in wealth its commercial transactions are more costly and require coins of corresponding value. As a matter of convenience, the payment of a debt is the standard in England; silver is the standard in France; and the comparative facility of effecting large payments in the current coins of the two countries can admit of little doubt. Habit will familiarise the use of silver, and render a people insensible to its inconvenience; but it is certain that in England fifty sovereigns can be carried about in a man's waistcoat pocket, while in France the value of that sum in silver would weigh about 48 lbs. troy; so heavy and bulky indeed would it be, that a carriage would be required to convey it from one part of Paris to another.

But the convenience of coin for a certain class of payments is a question quite distinct from that of its fitness for a standard of value. It is not necessary to exclude gold from the coinage because it is not adopted as the standard; it may be circulated as freely as the people desire to use it, while, instead of being the legal standard, its value may be calculated in silver. If silver be the standard, a large gold coinage may circulate at the same time for the convenience of larger payments, just as silver circulates for small payments wherever gold is the standard. In either case, under these circumstances the state is left to the lawful standard governs all calculations and bargains, while the other metal merely conforms to its standard, and is subsidiary to it. But even if the relative convenience of gold or silver as a medium of exchange were well understood, it could not be determined by the modes of effecting large payments only. All payments are calculated as easily in the coins of one metal as of another, in whatever form they may be actually effected. But by far the greater number of bargains are made for articles of small value. It is in silver and copper that the consumption of all commodities is mainly paid for. The wages of labour and the payments for small quantities, and in that form the prices of nearly all the ordinary articles of daily use are calculated. However the wholesale bargains of merchants may be conducted, the goods bought and sold by them are ultimately distributed to the consumers in small quantities, the prices of which are estimated in silver and copper. The aggregate value of the small bargains must be equal to that of large mercantile bargains which relate to the internal trade of individuals; and the sum of small quantities, the number they are beyond all comparison more important. It is certain also that in the vast operations of commerce the bargains, in whatever medium they may be calculated, are very rarely paid for in any coin whatever, but are settled by various forms of credit; while all minor transactions—the bargains of daily life—can be adjusted by money payments only. It is for such purposes therefore that the metallic currency of a country is mainly needed: and it may be contended with much force that silver represents the value of commodities more universally than gold, and is consequently a fitter standard.

The notion of a standard however cannot be determined solely by considerations of convenience; for we must chiefly regard its intrinsic qualities as a permanent measure of value. How shall uniformity of value be maintained as far as practicable for all the commodities it is in use? How is this main question to be determined; and not, Which is the most convenient form in which to make bargains? In what medium shall the whole property of the country be valued, from one year to another? How shall commodities be transferred from one hand to another prepared? How shall fluctuations be restrained in the value of this standard itself? These are the questions to be answered.

In favour of gold as a standard it is argued that being less extensively used for places and other manufactures, it is less an article of commerce than silver, and is therefore made more specifically to the purposes of money. On the other hand, it is contended that gold is used in large quantities for jewellery, coins, and ornaments; and, being infrequently, and particularly scarce material, its consumption in this manner affects its quantity and value to a greater extent than the use of plate affects the price of silver. And in this argument there is much weight, for it is estimated that the quantity of gold compared with the quantity of silver is as 1 to 50; and their relative value is as 1 to 15. (See Bullion Report, 1819, Allen's Evidence.) Now it is evident that any variation in the commercial demand for gold must be more sensibly felt than a similar variation in the demand for silver.

But it is not sufficient to consider the demand for the precious metals as articles of consumption only; they are suddenly sought for in large quantities to confuse the exchanges and drain away a country's resources. If the exchanges be unfavourable to a country, its precious metals are in greater demand for exportation than its commodities; or if there be a foreign war, its metals are in demand for the purchase of the necessary supplies. In time of war the precautions even other countries in the distribution of their resources. Here again gold must feel the demand to a greater extent than silver. If metals be required for exportation in payment of goods, gold is sure to be preferred by merchants; it is compact and portable; a large value can be exported at small cost and without difficulty; while fifteen times as much silver must be taken to effect the same purpose. In war gold is even more in request than for the purposes of commerce: its facility of transport is so important that it must be obtained at any cost, and it is consequently drained from all countries in which it can be found. Thus not only is gold, from its limited quantity, more sensibly affected by any increased demand than silver, but it is more peculiarly liable to be drained from a country to another: and this is the great and sudden drain of any country in which it forms the standard of value.

If it should happen that one country has a large gold coinage in circulation and in use for the purposes of commerce, while all the adjacent countries use a silver currency, and possess very little more gold than is necessary for its consumption, it is clear that whenever a large demand is suddenly made for goods, this country, which is in a currency. That country will be immediately used by all others as a rich gold mine, whence abundance of metal without alloy, and assayed ready to their hands, may at once be granted, without digging any new ore.
in the earth. No laws and no vigilance can restrain its export; as soon as it is wanted abroad, it disappears like water through a sieve. And this has been the case with England. Every other country in Europe has a silver standard; and whenever a country attempts to exchange for it foreign exchanges are unfavourable may be estimated from the returns of bullion retained by the Bank at different periods. On the 28th February, 1854, the Bank had in its coffers 19,810,000l. of bullion; at the same period, in 1825, it had 8,779,100l.; on the 31st August in that year its treasure was reduced to 8,634,924l.; and on the 28th February, 1829, to 2,459,510l. In the same note, the greater part of this money was the result of specie brought to the Bank, and but was reduced by the following February to 5,938,750l. A similar exhaustion of treasure was exhibited in 1838-9. In December, 1838, the Bank possessed 9,686,000l. of bullion; and in August, 1839, no more than 3,444,000l. These are undoubtedly very strong objections to a gold standard, and in order to test them thoroughly it would be satisfactory to compare the actual prices of gold and silver, and estimate their relative variations. But such comparisons are extremely defective, for there is no common standard by which to compare the price of each metal. If silver be purchased with gold, how shall we determine in which there has been an exchange? In the first place, the effect of the exchange is not the same. At the same price as with bank notes, there is a standard wanting; for the notes are made to conform to the value of the gold, and not to the value of the silver. These elements of uncertainty make it impossible to compare the prices of the two metals. The result of the exchange is, in fact, a purchase of the silver bullion, and upon them, the fluctuations in the prices of silver bullion would appear to be very slightly greater than those of gold. (See Bank Charter Report, 1692; see Paper, No. 722, App. p. 91.) This result does not corroborate the objections to a gold standard, but it must be recollected that, independently of fluctuations in the prices of bullion, a diminution in the quantity of money circulating in a country raises the value of the remainder, and disturb its relation to the prices of other commodities. It is in this form that the effects of an abstraction of gold must be felt rather than in the price of gold, and those who have to deal with the money of a country, or who are engaged in speculating, can only be affected with the money, and are not always perceptible. If a country had a circulation composed exclusively of gold, it might sometimes be deprived of all its money; if of gold and silver conjointly, it might sometimes be deprived of all its gold; but no country could be deprived of all or nearly all its silver by the operations of commerce. When paper money is added to gold and silver coins as part of the circulation, a country can always command a sufficient quantity of money; but the drain of its metals has an important influence upon the value of its circulating medium, and upon the operations of commerce; but of these matters more will be said hereafter.

The consumption of the precious metals as standards of value have now been adverted to. Both of them are less liable to variation than any other known commodity which could be used for the purpose of money; but of the two, the bullion of silver is more useful upon the whole, the most suitable for a standard of value. But whatever metal may be chiefly used as money, there is a disadvantage attending the circulation of coins which remains to be noticed. To maintain a large circulation of coins is the most expensive mode of furnishing a people with a medium of exchange. In the first place the whole value of the metals of which they are composed is subtracted from the productive capital of the country, in order to facilitate the exchange of other commodities. Unless this expense be absolutely necessary, it is an unwarrantable extravagance. It is as if children should play at cards with gold counters instead of ivory fish. Secondly, the wear and abrasion of coins makes it necessary to supply their deficiency with more of these costly metals, in addition to the amount already coined. Thirdly, not only are coins diminished in weight, but great numbers are irretrievably lost and destroyed. They are buried in the earth by miners, and never found again; they are lost in the sea; they are wasted by fire; they are dropped in the roads, and trampled under foot with the dust and stones. Everything, they may be destroyed by the want of the country, and wastes the products of its labour. Some cheaper kind of money therefore should, as far as possible, be used as a substitute for gold and silver; and such a substitute has been found in paper money.

Not only is paper more economical than gold and silver, but it is more convenient than either for effecting large pay-
the country in which it is issued; but it differs from gold and silver, inasmuch as it cannot serve the purposes of an international currency. Gold and silver are current all over the world, and their value is everywhere understood; but paper-money is necessarily confined to the purposes of internal circulation.

2. Promissory notes issued by bankers or other persons unconnected with the state, not being a legal tender, may be refused in payment of any debt. They can only be circu-
late-1, therefore, with the entire concurrence of those who receive them. It is by means of banking accommodations, however, that they usually get first into circulation. A per-
son who wishes to borrow money, if he is very particular concerning the form in which he obtains it, and he willingly accepts a note, if it be offered him instead of gold. He pro-
bably owes money to another, to whom he, in turn, offers the note as payment. This third party will readily accept it, for he wishes to secure the payment of the debt, and if he distrust the value of the note, he may immediately call upon the party who issued it, for gold. When the credit and sol-
veney of a bank are well known in any neighbourhood, its notes pass from hand to hand without any distrust, but they rarely circulate beyond the adjacent district. Within its own district they are received as money, as readily as a state banknote, and beyond its district, if the bank is known, they are sure to be returned for gold, just as a Bank of Eng-
land note would be returned from Russia. A bank of issue is also a bank of deposit, and the people amongst whom its notes are the best known are the most precise in the habits in which they issue them; and receive credit for them—not as notes only, but as current money: and when they draw again upon their deposits, they may receive the amount in gold and silver or in state bank-
notes only; not as the distinction between local and other descriptions of money is gradually lost sight of; they are readily convertible: they are universally circulated: habit familiarises the use of them; and at length, without the sanction of protection in any way, they become money: they are gold, and not the state, has coined them. Still any one may refuse to receive them, and the extent of their circulation depends upon the credit of the issuer. Let a whisper be heard against his honesty, or his single day not be returned to him for immediate payment in the currency of the state.

The circumstances which occasion a large circulation of both these kinds of paper-money in a country are, the convenience of such a circulation, and the difficulty of obtaining a sufficient coinage for effecting the various purposes for which money is used. The demand for money is continually increasing in proportion to the increase of commodities in quantity and value; and in a rapidly improving country no coinage can keep pace with such an increase. When paper-
money is issued it does not supersede gold and silver, but is used with them, and in the ratio of the latter. Its destruction is not, therefore, of the same as that of the coins; and if it be a properly regulated currency, its value will be precisely as large as that of the coins of a denomination. A hundred pound note is of as much money in the hands of a banker or sovereign as one of a hundred pounds in the hands of a sovereign. But how is this equality of value to be maintained between two descriptions of money differing so materially in character? Gold and silver, as already explained, have a known value as articles of commerce, and their value depends upon the quantity of labour required for their production. If this continue unchanged for many years, their exchangeable value may still be liable to fluctuation by reason of varying proportions of supply and demand. The supply of them may be the same with an increased demand; or the demand may remain the same, and the supply be either increased or diminished. But paper has scarcely any real value when used as money: the labour expended upon it compared with its denomination of value is merely nominal: and its value, supposing its credit to be good, must therefore depend entirely upon the proportion which the quantity of it bears to the requirements of commerce. If less be issued than there is a demand for, its value will rise; if it be issued in excess, its value will depreciate. So strong is the operation of this principle, that promissory notes, which are legal tender, are raised from the value of gold, though inconverible into specie, if their amount be suffi-
ciently limited. This result was actually produced, after the suspension of specie payments in 1792; when, so far from being a cause of the bankruptcy of the currency and the depreciated paper-money, a premium over gold, until they were issued in excess, and fell to a discount. It is evident, therefore, that the value of paper-money is independent of convertibility. If convertible, but issued in excess, its value will be depreciated; if inconverible, but limited in amount, its value will be sustained. And further, if government paper and local notes be concurrently in cir-
culation, as is the case when they are issued in excess, if both are to be depreciated, because the aggregate quantity of paper-money will be increased beyond the demand for it.

The mode of regulating the issue of paper-money so as to sustain its value and to prevent it from fluctuations which are those difficult problems which have perplexed theorists and statesmen, and still remain to be completely elucidated by experience; but the principles upon which any sound system of paper-currency must be founded are now agreed upon by the best authorities.

Let it be supposed that no paper-money is in circulation but government notes are; and let the paper-money be convertible into specie, and that it is the desire of government to maintain them at the same value as the gold and silver coinage. By what principle could the issue be regulated so as to effect this object? Gold and silver maintain a reasonable steadiness of price, as they are possessed of a real value, and being in demand all over the world, are distributed in quantities proportioned to the wants of each country. Without any standard price being fixed by the state, their value will, therefore, be self-regulated; but gold and silver are of any real value, has no element of stability in itself, and unless its issue is adjusted with the utmost nicety, its value will be constantly fluctuating. As the object to be secured is an equality of value between gold and silver, the precise amount of paper-money is an element of stability which is wanting in the latter, it is clear that paper-money must be made, in some manner, to conform to the value of the precious metals. Now this can only be done by converting it back into gold or silver, whenever its holders demand such a con-
version.

To regulate the issues of inconverible paper money is like filling a vessel with water in the dark, and without a measure: it is by the over and under issue that it is supposed to fall; while a convertible paper, under proper regulation, adjusts itself to the standard of the precious metals.

If convertibility is desirable when there is no other paper in circulation, then issues may be limited, or it is in-
convenient when promissory notes are permitted to be issued by other parties; for, in that case, it is necessary to guard against an excessive issue of both descriptions of paper; and when government paper is issued, other issues of paper will in some degree conform to its standard, as it, in its turn, con-
forms to that of the precious metals.

The manner in which convertibility restrains the over-issue of notes may be thus explained. If too much money be in circulation, its value is depressed, and the prices of commodities relatively raised. It thus becomes more profitable to export money than commodities in payment of the price of imports. But exports of precious metals or of any real value, has no element of stability in itself, and unless its issue is adjusted to the standard metal. If it be the sole or chief bank of issue, it will be the prin-
cipal depository of bullion in the country; and thus any drain caused by unfavourable exchanges will be first and chiefly felt by it. Persons wishing to export bullion will demand it of the bank in exchange for notes. In this way the bank is apprised of the state of the foreign exchanges, and learns that money is too abundant; while it has the power of immediately contracting its circulation by means of this very demand for bullion. It has merely to lock up those notes which it has received back in exchange for bullion, and every exportation of its bank-notes and imports from abroad reduces the quantity and restores the exchanges to a healthy state, by ad-
justing the quantity of money to the requirements of commerce. This is a simple mode of regulating the circulation of paper-money in a country, and upon which all the paper-money of any body only, it could not fail to be effectual. So far as the principle has been tested in England it has been successful; but its operation has been interfered with by the competing interests of banks and independent bankers, who have carried on the banking business with the issue of notes, in the bank itself.

Both those causes of disturbance have been partially provided against by the recent Bank Charter Act (7 & 8 Vict. s. 92), and the Bank of England of a few years ago, which extinguished any imperfection in the principle, that the paper-circulation of the country must be regulated by the foreign exchanges.

Any further reference to the particular laws and practice
by which the circulation of this country is regulated, in connection with a complicated system of banking, will be unnecessary for the explanation of principles, and these matters have already been considered. [3] But we cannot quit the subject of convertibility without advert- ing to a point of great import. In order to regulate the issues of paper with reference to the exchanges, it is by no means necessary that the issuing body should be given the power to give bullion in exchange for its notes, at the standard price, whenever a certain amount should be demanded. There can be no object in giving facilities to every person who possesses a 2d note, to receive gold or silver, and much mischief is caused by such facilities, in times of panic; while, on the other hand, no impediment would be offered to the great operations of commerce by raising the minimum quantity of bullion to be demanded. By this arrangement whenever notes fell below the value of bullion, they would be brought in exchange for it, until the prices of both were again equalized; and if, by any undue limitation of issue, the value of notes should be raised above that of bullion, the bank should be obliged to give its notes in exchange for bullion. In this manner the circulation would be enlarged and the equilibrium between the two would be maintained. The proposition was again made by the late Mr. Ricardo in his able pamphlet entitled "Proposals for an Economical and Safe Currency," and was carried into effect, for a short period, on the resumption of specie payments; but it was succeeded by the present plan of convertibility into gold coin, which is more costly and less secure in its operation.

In regard to the issue of paper-money there are two conti- nental theories, which remain to be noticed, although it will be impossible to enter fully into the arguments by which each is supported. By one it is proposed that all paper-money should, like gold and silver, be coined by the state alone, in order that its issue may be properly regulated and its converti- bility secured. By the other it is maintained that the issue of paper-money should be open to all persons without restriction, like the drawing of bills of exchange, except in so far as securities may be necessary for the solvency of the issuers. In this country neither of these principles has been adopted singly, but the circulation has been founded upon the union of both. It has however been the policy of the government gradually to contract the issues of private banks, and to replace them by the notes of the Bank of England, which, for the purposes of issue, now stands in the position of the govern- ment itself.

In considering the relative merits of a system of government issues and of free competition amongst issuing bodies, there are three main questions to be considered: 1st, the profits arising from the issue of notes; 2dly, the solvent of the notes themselves; and 3dly, the effect of the future, and the present, of paper-money on the general wealth of the state. If the two first questions were the sole consideration, it would be difficult to oppose the claims of those who insist upon the right of free issue.

The first principle, that profit from principle at the bank of issue may be regarded as one of the many forms in which profits are realized by trade. It is true that the right of issuing money has ordinarily been claimed as a prerogative, and that promissory notes might be included in that category. If such a claim had been made on the first introduction of paper-money, it could undoubtedly have been supported by the analogy which paper-money bore to a coinage; and if the law had pronounced in favour of the claim, a lucrative prerogative would have been created, instead of a profitable branch of banking. But no such claim was advanced: the issue of notes has always been distinct from the coinage of money; and the state is now no more entitled to the profits arising from a paper-circulation, than to the profits of any other de- scription of business.

2. The solvency of the issuers of promissory notes is a matter which can be provided for by law. There are few who will question the necessity of some security, when money is permitted to be issued by private parties. It is indeed contended that the power of issuing money for the purpose of exchange—that it represents capital and securities, and that, in its representative character, it is circulated instead of money, upon the credit of the issuer, and upon the responsibility of those who accept it—does not necessitate the existence of a regu- lation between a promissory note and a bill of exchange. The one is.

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money and discharges a debt; the other leaves a debt out- standing until the bill becomes due and is paid. Again, a note passes from hand to hand upon the sole credit of the issuer; a bill of exchange passes upon the credit of the acceptor, but also upon the credit and responsibility of each indorser. A bill is circulated amongst merchants pre- cisely as credit is given to persons of known solvency; but a promissory note, while it may be the security that is lost, if received at all, is received as money. It is obviously just, therefore, that when the state permits so important a privilege to be exercised as that of the issue of money, it should at the same time provide for the security of its effect. The issuer cannot be enforced without interfering, in some measure, with an unrestricted freedom of issue, but they are essential to the public safety, and they should on no account be neglected.

3. But the solvency of the issuers of paper-money is not the only consideration that those parties only who may happen to hold the notes of a particular bank: it does not affect the whole country. If a bank fail, its creditors suffer like the creditors of any other bankrupt firm; but the general business of the country is not disturbed by its failure. On the other hand, however, the regulation of its issues had an influence upon the entire trade of the country. However effective it may be against the insolvency of private banks—however complete the protection of the individual holders of their notes—the public interests are still in need of protection against the consequences of an ill-regulated currency.

The securities against over-issue are entirely distinct: the former may be complete; the latter may, at the same time, be inoperative. The mode of sustaining the value of paper- money on a par with the precious metals is thus explained. It is only by means of convertibility and by a refer- ence to the foreign exchanges, that the issues of paper can be adjusted to the wants of the country; and this principle is incompatible with an unrestricted issue of paper by private banks.

If no control be exercised by government or by some central body over the issues of private banks, notes will be circulated, not according to any fixed principle, nor with reference to the exchanges, but to promote the business of banking. If too many should be in circulation, the action of the foreign ex- changes cannot be brought to bear upon many independent banks with sufficient force and distinctness, and the converti- bility of all the paper-money in the country is consequently endangered. This is the danger which is sought to be averted by restrictions upon the issues of private banks, and by the gradu- al substitution of the notes of one issuing body for those of many. No interference with the business of banking would be justifiable, except for the protection of the public interests; but the evils arising from the suspension of specie payments are so great, that every practicable provision must be made to avert it. When all commercial transactions, it injures public credit, disturbs prices, and suddenly withdraws the standard of value by which all existent obligations and all specie circulating are measured. If therefore the whole body only, a limitation of its issues, as already noticed, may sustain their value; but when many independent bodies are issuing notes, during a period of inflation, the system is, of course, unable to regulate or to limit their issues, and it is almost certain that their notes will not only be greatly depreciated, but also will be liable to constant fluctuations of value.

There are some political reasons who have sacrosanct every commercial convulsion to an ill-regulated currency; while others deny its influence upon prices and upon the general arrangements of commerce. The opinions of both these vari- ations are probably extreme, and their facts somewhat exagger- rated; but the temperate view taken by Mr. S. Jones Loyd may be adopted with less hesitation. He says, 'The curren- cy, in which all transactions are adjusted, has the same reference to the healthy state of trade, which the atmosphere in which we all live has to the physical constitution of our bodies; irregularities and disorders may arise from a variety of causes, but the health and virulence of the atmosphere generally depend upon the pure, healthy, and well-regulated condition of the medium in which we exist. A well-managed currency cannot prevent the occurrence of periods of excite- ment and over-extension, nor of periods of deficiency; but it may very seriously diminish the frequency of their return, to restrain the suddenness of their outbreak, and to limit the extent of the mischief.' (Remarks on the Management of the Circu- lation, 1840.)
As yet such promissory notes only have been spoken of as payable on demand: but a few remarks may be added concerning promissory notes and bills of exchange payable at some period more or less distant. These are regarded by some as an improved and improved state of the general circulation; but the essential distinction between them and paper-money has been more than once noticed above. They do not discharge obligations, but are merely written engagements to pay at a future day. They are one of the many forms of credit, and as such are used as substitutes for money; but they cannot be considered a part of the national currency. When transferred from one hand to another they become money, as the bearer of a debt, but the payment is guaranteed by each endorser in succession. It is true that they are among the most efficient agents for economising the use of money, and that they leave the circulating medium more free for other purposes, in which payments are made in notes or specie. If this were not the case, the circulation of notes must be almost indefinitely increased in order to meet the various demand of commerce; but this economy in the use of money makes a comparatively small circulation sufficient. It is this circulation, however, of which the relative scarcity or abundance affects the prices of commodities and the foreign exchanges. The final settlement of all these circulating mediums must be in the current medium of the country. If money be dear, the acceptor exchanges more goods for it in order to meet the bill when it becomes due. If, however, it be relatively cheap, he makes a better bargain. But the bill of exchange is itself as much a money as the goods which had been originally purchased with it. Every bill of exchange when first drawn and accepted, and subsequently presents, at each commercial transaction, of which the bill is the immediate result. The number and amount of bills of exchange in circulation cannot therefore be added to the currency in order to compare the aggregate circulation with the aggregate amount of commodities; for those commodities which are exchanged by means of bills may be set off against the value of other commodities represented by the bills, while the notes and specie taken in payment may be compared with the aggregate of other transactions, added to the balances of accounts arising out of the final settlement of bills of exchange. It is undeniable that bills of exchange perform many of the functions of money, and they are regarded as a part of the circulation by some high authorities in monetary matters; but it appears to us that the balance of reason and of authority inclines to the other side and assigns to bills of exchange a distinct place as substitutes for currency instead of including them as part of the currency itself. (See the Evidence upon this point before the Committee on Banks of Issue, 1840.)

A similar question arises in reference to the monetary character of a banking department. Do they create money or not? The transfer of deposits pays debts and purchases commodities; it performs the functions of money, and so far would seem to be a part of the currency and to have an influence upon the currency. But in the former change, the whole of the deposits are money, for a large portion of them is invested by the bankers; and if every depositor were to call for his deposits at once, they could not be paid. Nor can the uninvested portion be properly called money; it is a form of credit which, like bills of exchange, economises the use of money and is a substitute for it, but is not the thing itself. It bears so close a resemblance to currency that to assign to it a distinct character is a matter of some difficulty; but still we are disposed to class all portions of banking deposits which are not actually held by the public as money; in this category fall the bills of exchange, book-debts, and transfers in amount. All these are modes of facilitating the exchange of commodities by a refined species of barter, without the intervention of any circulating medium. Each transaction is valued in the current medium of exchange, and final settlements of accounts are settled in money; but the estimated value of the transaction itself cannot be reckoned as a part of the circulation, for if it were, then commodities themselves would be money.

An ordinary case of barter would seem to offer a good illustration of the functions of all forms of credits as substitutes for money. Suppose a merchant, A, to have indigo to the value of 100,000l. that he wishes to purchase the cotton of the same value, which B is willing to give in exchange for the indigo. The transfer is made at once between them: the transaction is complete without the passing of a shilling, for the indigo performs the functions of money. But can the indigo on that account be reckoned as a part of the circulating medium? Suppose again, that these merchants, at the time of the transfer, each drew a bill for 1000l. upon the other at three months, which each accepted. These bills would represent the whole of the exchange in the clearing of the cotton; but no money would pass between them until these bills became due, than if no part of their bargain had been committed to paper. When the bills became due, each would be indebted to the other exactly to the extent of the sum on the face of the other; or each might transfer a portion of his bank-deposits to the other. In the case first supposed, no money would pass, but one commodity would be taken as an equivalent for another, and for that purpose the cotton and indigo might be accepted as an equivalent for the goods without the intervention of a money payment: and this credit would afterwards be exchanged for another form of credit—a bank-deposit. In neither case, as it would seem, does the transaction involve the use of any portion of the circulating medium, nor call any new description of currency into existence.

It is of the utmost importance to form a clear opinion as to the distinction between various forms of credit and the circulating medium of a country; for if they be confounded one with another, all the established theories of currency are put into confusion. All hopes of regulating and controlling the circulation must be in vain, and the variety and magnitude of the consequences of a bad system would be such as to defy the operations of the government, or of a bank, by means of paper issues, which would form only an insipid substitute for an adequate currency; and free trade in banking and free trade in the circulation of money might be recognised as the only reasonable principle for supplying commerce with a circulating medium.

We have stated the two main principles involved in the consideration of the character and functions of money. In treating of a subject which has been so fruitful of controversy, we have been obliged to touch lightly upon many points which to deep students of the 'currency question' may seem to have deserved more consideration. To examine them fully would add volumes to the many which have already been published upon that subject; and frequent allusions to the opinions of others; besides ourselves, have given a counter-

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MONNOYER, JEAN BAPTISTE, a very celebrated fruit and flower painter, was born at Lille, in 1685. He was educated as an historical painter at Antwerp, but he afterwards adopted the plant, and went to Paris, where he was noticed and employed by Le Brun, and in 1655 was elected a member of the French Academy of Painting. He was employed by Le Brun in the decoration of the palace of Versailles, and in an assortment of flowers and other similar pieces. It was owing to the beauty of these works that he was invited, about 1689, to London by the Duke of Montague, then English ambassador at Paris, to decorate Montague House (the present British Museum), a siting place of flowers and other similar pieces. The free and beautiful flower decorations of this palace, which is now pulled down, must still be fresh in the recollections of many who have been in many other nobleman's houses in London and at other places; at Burlington House, at Lord Carlisle's, at Hampton Court, and at the Duke of St. Albans' at Windsor. One of his most remarkable works is a looking-glass painted in Kensington Palace for Queen Mary, which was purchased for a very high price from seeing him paint, that he spent nearly all the time that he was at work in watching him. There are fourteen flower-pieces by Monnoyer, or Baptiste as he is now called, all made in England, in the apartment named George II.'s private chamber, at Hampton Court; they are however dirty and badly hung. Monnoyer was commonly styled the 'flower-painter' in England in his own lifetime. He paid a few visits to Paris after his first visit in London, but his permanent abode was in London, where he died in 1699, and was buried in St. James's. The French offended him by allowing his son-in-law, who was a painter and living at Paris, to be his partner in the business of the flower-painting business in London. Monnoyer's style, though not so far as minute or highly finished as that of Van Huysem, is infinitely more free and more brilliant, equally true and more effective; this is the result of his colouring, and light and shade, and touch, are all equally excellent and faultless: his works in their perfect condition must have rivalled nature herself. The brilliance of his colouring is extraordinary. He was particularly skilled at grouping roses, poppies, tulips, and a few white flowers together in a blade vase, and there are several etchings of such groups by his own hand: the vases are placed on pedestals or tables. His best works and in this country. The prints after his works amount to over 80, and make a good folio volume: his own etchings are marked J. Baptiste, sceps., whereas probably his now common name of Baptiste. His son Antoine Monnoyer, likewise a good flower-painter, was called the younger Baptiste in England. There is a portrait of Monnoyer engraved by White from a picture by Sir Godfrey Kneller.

MONOTROPA (from μονός, one, and ρίζα, a turn), a genus of plants belonging to the natural order Ericaceae and the family Monotropaceae. The species Monotropa uniflora consists of 4-6 petals each, with a hooded nectariforous base; 8-10 stamens with kidney-shaped 1-stellate anthers; a pelted stigma; the capsule 5-stellate, 5-valved, many-seeded. The species of this genus are singular, occurring in single parts, growing in the roots of trees, and destitute of the green and yellow characters which characterize the other forms of vegetation. The flowers of yellow Bird's-Nest, has the flowers in a drooping cluster, lateral ones with 8 stamens, the terminal ones with 10 stamens, the flower erect, the bracts and flowers glabrous externally. The stem of this plant attains a height of 6 or 8 inches, and is silvery-white, the leaves terminating in a short cluster, dingy yellow, at length turning nearly black. The flowers with large scaly bracts. It is native of Great Britain. This, with the other species of Monotropa, appears to have been supposed by Linnaeus to be parasitical upon them; recent researches have, however, led to the conclusion that in the case of this species such an opinion is erroneous. Mr. Rylands, in a paper published in 1861, has stated that the species Monotropa uniflora possesses masses of a fibrous substance, which adhere to their fibres and the roots of the plant near which they grow, so closely that they are supposed to be portions of the roots of the Monotropa. On examining this fibrous substance with care, Mr. Rylands found that in all cases it consisted of a species of hyssodoid fungus which had been developed upon the roots of the Monotropa, having no organic connection with the plant. On the appearance of Mycosphaera, varicollic in different specimens, and were found to belong to hitherto undescribed forms of Cryptocaps. There can be little doubt that the other species of Monotropa are of the same nature as Hypopygium, and that these old names have referred the species here described, and two others, to a genus called Hypopygium. This includes the European species, whilst the old genus, Monotropa, embraces two North American species, namely M. californica and M. uttifera. The last species have not the musky semi-fragrant odour of those belonging to the genus Hypopygium. (Don, Gardiner's Dictionary; Physiologist, vol. i.; Bayntting, British Flora.)

MONTAGUE, GEORGE, was descended from an ancient family residing at Lackham, in the central part of Wiltshire, where he had an estate. He was distinguished for his love of natural history, and was one of the early members of the Linnean Society of London. In 1802 he published an 'Ornithological Dictionary, or Alphabetical Synopsis of British Birds,' 3 vols. 8vo. This work exhibited much research as well as an extensive knowledge of the department of natural history to which it was devoted, and may be consulted with advantage at the present day by the ornithological student. In 1803 he produced his 'Testacum Britannicum; or a Natural History of British Shells,' 2 vols. 8vo, containing several plates and descriptions of new species. Besides these two great works he published several papers in the Transactions of the Linnean Society. Of these the following are the principal—

4. On the larger and lesser Species of Horse-shoe Bats, proving them to be distinct, with a Description of Vespertilio Barbastelliates taken in the South of Devonshire. Vol. ix. 1805.
6. Of several New or Rare Animals, principally Marine, discovered on the South Coast of Devonshire. Vol. xi. 1811.
7. Of some New and Rare British Marine Shells and Animals.—Ib. During the latter part of his life Mr. Montague lived at Knowle, near Kingsbridge, in Devonshire, where he died in 1815. (Biographical Dictionary of Living Authors; Watts's Bibliotheca Britannica.)

MONTALEGRE, MARC-BENE, MARQUIS DE, a distinguished military engineer of the eighteenth century, was born July 16, 1714, at Angouleme. He was descended from an ancient and noble family; and, having received an education in which both literature and science were judiciously conjoined, he entered the army at eighteen years of age. In the course of his first campaign (1733), he was present at the siege of Basle, and in the following year joined de Prasle, engaged him. It was afterwards, the consideration which he held by the military art. He was admitted a member of the Académie des Sciences in 1747; and he wrote several memoirs of improvement in the volumes published by that body. About the same time he established a foundry at Perigord for the purpose of casting heavy ordnance, which was then much wanted for the French navy. During the Seven Years' War Montalegre, attached, as an agent for the French government, to the staff of the Swedish and Russian armies; and he appears to have been consulted by the allied generals respecting the arrangements of the plans for the different campaigns. In 1774 he
published a small work entitled 'Correspondance pendant la Guerre de 1757,' which contains much interesting matter relating to that war. In 1778 he was appointed to construct a fort for the purpose of securing the Darte of Aix against the English fleet; and this fort, which was built entirely of wood, is said to have borne, without experiencing any damage, the shock occasioned by the simultaneous firing of all the artillery which had been directed against it; it has been made in order to disprove the assertion of several engineers that the fort would fall in ruins by the fire of its own guns.

Montalembert published, in 1756, a small work in 4to, entitled 'La Fortification Perpendiculaire ou l'Art Defensif superieur a l'Osmale,' which was published at Paris in eleven quarto volumes (1776 to 1796). In the first volume, having shown the defects of the bastioned fortifications which are constructed according to the principles of Vauban, he proposes to suppress the flanks of the bastions, continuing the faces of those works till they meet in the middle of each front of fortification, and, at the same time, a casemated work like a small ravelin. The advantage to be gained by this project is, that it saves the expense of the construction; and, after proposing some other modifications of the existing fortifications, Montalembert dwells at length on a system which gives its name to the treatise. [FORTIFICATION, P. C.] The perspective drawing of the fortifications, the branches of which form right angles with one another at the re-entering parts, and three of these are defended by a powerful fire of artillery, which, being placed in casemates, is not liable to be destroyed by the enemy; while spacious terre-pleins at the foot of each rampart afford rooms for the troops of the garrison to engage the besiegers with forces superior to any which can be brought against them.

In a second volume, after giving an interesting account of the war in 1741, in which the importance of fortified positions is pointed out, he describes the construction of redoubts or small forts. In the third volume there is a project for the construction of a simple fortification, consisting of a creased wall covered by a rampart on which are constructed casemated traverses: this is proposed as a good kind of defensive work for sea-ports; and it is said that some of the forts which defended Cherbourg were executed on this principle. The fourth volume contains an abridged history of the reign of Louis XIV., together with sundry projects relating to the formation of lines of intrenchments for the defence of the coast. In the fifth volume, he remarks the state of the batteries for the defence of seacoasts; and the sixth and seventh volumes are occupied with refutations of the objections which had been made to his system, and contains plans of the forts at Cherboue and on the Isle of Aix. The ninth volume, which is particularly entitled 'L'Art Defensif superieur a l'Osmale,' contains sundry projects for circular redoubts and for the construction of redoubts.

In the tenth and last, he contains memoirs relating to fortification and artillery. The leading principle on which the projects of this engineer are founded, is that a fortified post should contain an abundance of casemates for the security of troops and artillery: Montalembert considers that these alone will enable a small number of men to resist with success the attack of a numerous army, and that a few guns so protected are capable of dismantling all that an enemy can place behind parapets made merely of earth. His projects were severely criticised during his life; but, though some parts of his constructions are open to objections, the principles are unexceptionable; and it is important to observe that many of his ideas have been adopted by the Prussian and Austrian engineers in the works recently constructed for the defence of Western Germany.

In 1770 Montalembert married a lady who was distinguished as a performer on the stage, and who wrote a novel entitled 'Elise Dumesnil,' which was printed in London in 1798. It is said that Montalembert composed for the theatre some small pieces which had a certain success, and that the attachment to which he is proved to have been indebted for the fact that his biographer, Lalande, had, in his possession a number of his songs and tales in verse which are said to have been characterized by grace, elegance, and imagination. In publishing his great work, and in making his experiences for the improvement of the military art, he seems to have incurred expenses which injured his fortune. He had given up to the government his founreder at Perigord, and his application for the reversion of the same was rejected, for which he claimed that the 3000 francs which he received as an equivalent were fruitless; he was even deprived of a pension which he enjoyed for the loss of an eye in the service of the country. About the year 1790 he came to London; but, after some years of some success, he was forced to leave his wife in this country. It is said that, in order to save some of his property, he joined the revolutionary party; and it is painful to record that he entered so far into the prevailing spurious ideas of the time.

Monten, Dietrich, an eminent German battle painter, was born at Düsseldorf in 1790. He showed from his earliest youth a great love for accounts of wars and battles; and he was ever a friend to the English painter, Hogarth, from whom he used to sketch the most striking scenes of arms. In order that he might have some practical knowledge in military matters he enlisted into the Prussian army as a volunteer in 1818, and served accordingly for twelve months. At the expiration of his term of military service, he entered the Academy of Arts of Düsseldorf, and after studying two years in that institution he removed to Munich, in order that he might benefit himself by the study of the works of Tieck, Herbrand, and rivals Horace Vernet as a battle painter, and is still resident in Munich.

Monten was not long in attracting the attention of Cornelius, then the Coponcussa of the painters of Munich, and the notice of the present king of Bavaria, Ludwig I. He was intrusted by Coradelli, in 1827, with the execution of three of the frescoes of the arcade of the Hofgarten—the storming of the Dutch and the night attack, and the battle of Saarbrück, 1815, for the Hall of Victory (Siegesaal) in the state apartments of the new palace; and for the same patron of the arts, the departure of the Foles from their fatherland, and the meeting of the Garatowia with the Turks. These were painted for the Tyrolean hall in the hunting lodge of Prince Adolphus in the battle of Lützen, in the King of Hanover's collection; in 1838, by George I. in the battle of Neurwinden; and in 1830, by the great camp in 1838 at Augsburg, for the Emperor Nicholas, at which the emperor was present. He depicted besides these principal works many smaller pieces, which are all conspicuous for extraordinary spirit in the incidents and in the execution, and display much fine drawing and fine colouring, though in many parts too sketchy and undefined; he wanted the necessary patience for elaborate moulding and uniform finish. But when the exact degree of this technical excellence is missed, its absence is more agreeable than its excess; and all Monten's works have a very agreeable effect: their greatest defect is an occasional extravagance of action. His horses are always very spirited. He died after a short but severe illness, in December, 1844, in the prime of life, being in his forty-fifth year; but his memory is universally regretted by all who knew him. Several of his works have been lithographed by Bodmer, Hamstädl, and others.
verses; but the very few events of his life which are exactly known fall within the reign of King James VI. of Scotland. He is described as having been a captain, probably in the guard of Morton the regent. King James quotes some of his poems in a work of his own, published in 1592; and he owned the manuscript of a hundred or more, which led him into a troublesome law-suit on his return from a continental tour, begun in 1586. He appears to have died between 1610 and 1614. It is thought that he wrote and published his principal work, an allegorical poem, called The Cherry and the Sloe (or Sloe). This poem is still popular in Scotland, and has been very frequently reprinted in recent years. It is a romance, and both the style and subject of the poems are both lively in fancy and pleasing in versification. In 1582 there appeared at Edinburgh a neat edition of all his poems, edited by Mr. Laing, with a biographical preface by Mr. Irvine.

MONTIA, a genus of plants named in honour of Dr. Joseph Monti, professor of botany and prefect of the medical garden at Bologna. He paid much attention to the scientific arrangement of the Gramineae and Cyperaceae. He published also a catalogue of the plants in the botanic garden at Bologna, in which he described several new species. The following are the principal works which he published:—1, *Catulli Stirpium agri Bononiensis, Gramineae et Cyperaceae deponenda complectens*, Bononia, 1719, 4to. 2, *Indices Horli Bononiensis ad Usum Demonstrationum quae in Horto Bononiensi quadrantis habentur*, Bononia, 1724, 4to. 3, *Descriptio curiae, capítulo, et arborum Regis Hortus Portulacaeae*, and has a persistent caustic of 2 sepals; a corolla 5-parted with 3 segments smaller than the others, with the tube split to the base in front; 3 stamens inserted in the throat and opposite to the sepals. The flowers are white or pink, the style very short; the stigmas 3, downy; the capsule of 1 cell with 3 valves and 3 seeds. There is but one species of this genus, *M. fontana*, which is native of Great Britain. It is also found in North America and long-petalled, white, and ditches; and is commonly known by the name of waterhickweed. It closely resembles the species of the genus Claytonia (Washington, *Manual of British Botany*).

MONTORSOLI, FRA GIOVANNI ANGELO, a celebrated Italian sculptor, was born in 1507, or about the beginning of the sixteenth century, at Montorsoli near Florence, on the road to Bologna, a villa belonging to his father Michele d'Angelo da Poggibonzi. He was first instructed by Andrea da Firenze, with whom he lived three years. After the death of his father he found employment at Rome, at Perugia, and at Volterra, where he assisted in making the monument to Raffaello Maffei. He was next employed by Michelangelo in the church of San Lorenzo at Florence, and gained the admiration of the greatest artists in the city. In 1547 Montorsoli had a special dispositive to Rome as it appeared to him to the only life in which peace was to be obtained; but after trying in vain several convents, he fixed, in 1550, upon the church of San Lucina, and began to work as a friar of the order of Servi della Numizita. Shortly after he had taken up his abode in this convent, he was called to Rome by Clement VII. to restore several ancient monuments, much to the dissatisfaction of his brothers of the Numizita: he had been recommended to the pope by Michelangelo. Montorsoli restored the Laocoön, to which he made the right arm, and he made the left arm of the Apollo, and executed other restorations. When these and a statue of the pope were finished, he returned to Florence with Michelangelo to complete the statues and other sculptures of the sacristy and library of San Lorenzo, of which his best is San Cosimo. After the death of Clement, Montorsoli again joined Michelangelo at Rome and assisted him in the works of the monument of Julius II.; but while engaged on this work he was invited by Cardinal Tornone, and advised by Michelangelo, to go to Genoa and become a commissary in charge of making him to make four great statues, but owing to difficulties with the treasury and servants of the court in France's absence, Montorsoli left Paris and returned to Florence without executing his commission. He then went to Naples, and there constructed the tomb of Jacopo Sannazzaro. He next finished at Genoa the statue of Andrea Doria which was commenced by Domenico, and was now finished by him. At Florence, he finished the church of San Matteo there with many works. Upon the completion of these works he returned to Michelangelo at Rome, but departed again soon afterwards, in 1547, for Messina, where he was employed to make a grand fountain for the place in front of the cathedral. The principal basin is thirty-four palms in diameter, and is ornamented on its twenty irregular sides with twenty bassi-relievi illustrating the various ancient fables connected with the watery element: it has besides the usual usual spout in the centre of which is contrived for jetting the water: the whole fountain is crowned by a figure of Orion with the arms of Messina engraved upon his shield. The second basin is forty feet in diameter, and the great work induced the Messinese to commission Montorsoli to erect another fountain in the front of the Dogana (Custom-house) close to the sea. He designed also at Messina the church of San Lorenzo, a large and beautiful edifice containing other admirable works in architecture and in sculpture. But in 1557 by a decree of Pope Paul IV., all religious persons, or all who had taken holy orders and were living at large in the world without respect to their religious character, were ordered to return to their convents and resume their religious habits; and Montorsoli was accordingly obliged to leave many works unfinished, which he intrusted to his pupil Martino, and he returned to his convent at Florence. He was however shortly afterwards called to Bologna to construct there the high altar of the church of his own order dei Servi, which he completed with great magnificence in twenty-eight months. He returned to Florence in 1561, and being rich he built a sepulchre for artists in the chapter-house of the convent of the Numizita, with the requisite endowment for regular masses at appointed times, and gave the whole sepulchre, then the most costly in Florence, to the convent of the Holy Luke, or company of painters, &c., which upon the completion of the sepulchre, was at a solemn feast celebrated by forty-eight of the principal artists of Florence, re-established by the consent and authority of the Pope Julius II. He died on the 17th of May, 1566, and was buried with the convent of the Church of the Holy Luke. His body was afterwards removed to the church of San Lorenzo at Florence. He was a man of fine taste and great erudition, possessed of a large library of useful books and pamphlets.

MOORELLI, COSIMO, an Italian architect of considerable note among those of the last century, was born at Imola in 1730. He was the son of Domenico Morelli (an architect also), and studied under his father. He was placed in several works of merit at Imola. It was Cosimo's good fortune to obtain powerful patronage at the very outset of his professional career,—first that of Gian-Carlo Nandi, bishop of
Of Imola, for whom he made designs for rebuilding the cathedral of that city, and through him, that of his nephew Giovanni Antonio Braschi, who was elevated to the papal throne in 1775 under the name of Pius VI, who inevitably appointed him city-architect at Cesena (the pope's native town), and among various other commissions concerned with the design for the new building of Peter's. If that and some other projects were not realized, the designs themselves obtained universal though transitory admiration. No art is more subject to blight than architecture, perhaps of which the fashion is often rejected as quickly as it is adopted by him, namely, the cathedral of Imola, the metropolitan church at Fermo, the duomo at Macerata, and the conventual church at Fossombrone, St. Petronio at Castel Bolognese, a church at Barbianum, that of the nuns of St. Chiara at Imola, and St. Maria in regola in the same city, and another church at Lugo, also some alterations in the metropolitan church at Ravenna. It happens, too, rather singularly, that Morelli was almost as much employed in theatrical as in ecclesiastical architecture. The buildings of this class erected by him are—the theatre of Imola (destroyed by fire a few years afterwards, but preserved in the volume of engravings of the buildings of Ferrato, Ferrao, Jeonini; also, that of Ferrara, which is confidently claimed for him by some, although Foschin was likewise in some manner or other employed upon it. [Foschin, P. C. S.]) Besides the above works, he has been engaged at Hangaroa, at Genoa, at Pisa, at Fiume, the Berio at Naples, and the Cappel at Bologna; the façade of the Ridotto at Cesena, and the Hospital at Imola, the façade of the Palazzo Publico, and the Palazzo Vecchio. He would probably have done more, had occasion not always been wanting. The uncertain state of things in Italy for architecture towards the close of his life. He died, after a severe paralytic attack, in February, 1775.

(T. Papotti, in Tipaldino's Biografia.)

MORELLI, GiaC ouMO, one of the most distinguished librarians of modern times, was born at Venice on the 14th of April, 1746. He was the son of poor parents, who were unable to give him a liberal education. It was against his will that he resolved to enter the church, although in all other respects he always showed the greatest deference to their wishes. He afterwards supplied the deficiencies of his education by private study; and the knowledge which he thus acquired was more substantial and extensive than that of any of his Italian contemporaries, though it was not till late in life that he became acquainted with the Greek and French languages; through his own studies he became a good Latin scholar, well acquainted with the library of the family of the Zaniani, and his unsubmitting perseverance attracted the attention of the librarian de Rubia, who became his secretary and a friend. After having traveled through the greater part of the country in Italy with the avowed object of acquiring knowledge, he led him to examine the other libraries of his native city to which he could gain access. His love of independence induced him to refuse several very advantageous offers that were made to him both by the church and by wealthy collectors of books at Venice, and he continued to live as a simple Abbé. He formed however an intimate friendship with the patrician Farsetti, of whose rich collection of MSS., he published a catalogue, under the title of 'Biblioteca Manoscritta del Bar T. G. Farsetti,' Venice, 1771-80, 2 vols. 12mo. While this work was in course of publication he also wrote 'Considerazioni storiche della Biblioteca di S. Marco,' Venice, 1774, in which he discussed and solved a great many questions connected with the history of literature. He then prepared a similar work on the history of the MSS. of Venice, which he published in 1783. He also accompanied his friend Farsetti; but the materials which he collected for that purpose were unfortunately left in the hands of Colle, the historiographer of that institution, through whose care they were lost.

The next catalogue of the MSS. of the library of the Narni family; and somewhat later a catalogue of the MSS. of Italian works contained in the same library. The last two publications are of an honourable place among the eminent bibliographers of modern times; but he acquired a still greater reputation as librarian of the library of St. Mark, an office which he received in 1778, and which he held until his death, which happened on the 6th of May, 1819. He devoted himself with the greatest zeal to the completion and arrangement of that famous library; but during the French rule in Italy he was, together with his projects for the building of a new library from its venerable antiquated building to a new one, the splendid and convenience of which however caused him in some measure for the loss of the former building. In 1795 he discovered a manuscript of Dion Cassius, which he published at Bologna, together with several new readings of other books of the same historian. This little work was afterwards (in 1800) republished at Paris, under the title of 'Dion Cassius,' of which only one volume was published. Although Morelli's work exhibits his extensive knowledge and his critical acumen in the strongest light, its 'Biblioteca Manuscritta, Græcorum et Latinæ,' of which only one volume was published, was not so successful, though it contains many valuable materials for several more volumes. His last production was 'Epistolæ Septem variae Erodutianæ,' Padua, 1819. Abbé Morelli is acknowledged by all who have occasion to visit the library of St. Mark during the time that he was at the head of it, to have been the most amiable, kind, and obliging person, and his vast learning was equalled only by his extraordinary modesty. After his death there appeared, 'Oeuvres inédites du M. de l'Abbé Morelli,' by his son, Monumenti dell'Istituto di Antichità Scrittori, Venice, 1820, 3 vols. 8vo.

(Bettio, Orazione recitata nelle solenni Eseguene nella Chiesa Patriarciale di Venezia, Venice, 1819.)
Filippo must have made a visit with his wife to Florence some time after his marriage, and before the birth of Raphael, as Florence was a popular resort of artists and a centre of art and the prints of the celebrated plate engraver were sold as early as his twelfth year. But his first engravings of consequence were seven plates from the masks of the carnival of 1778, the Pilgrimage of the Green Lion, and the Celebration of the Monstrous Fruit. The engraver was then but a youth of twenty, that his father deemed it right that he should have the benefit of the best instruction that could be procured, and sent him accordingly to the celebrated Volpato at Padua, to be instructed in engraving, as a whole master. He never entered the Church and Mary Magdalen in the Garden, to copy. He engraved also about this time Gavin Hamilton’s allegoric figure of Painting, for the brothers Hackert. In 1781 he engraved Raphael’s allegoric figures of Poetry and Theology, from the Vatican. In the same year he married Volpato’s only daughter Domenica; and assisted Volpato on his plate of the Panamaus of Raphael, or the historical illustration of Poetry, in the Stanz of the Vatican. In 1787 he engraved the Aurora, painted in fresco by Guido for the garden-house of the Palazzo Rospigliosi; but this, though one of his principal works, is not one of his best. Though some of its parts are better, the Hours around the chariot of the Sun are less graceful and less buoyant than those in the print by Fry, executed long before it. The extremities, especially the hands, are both badly drawn, but those of Morghen’s print are inferior to those in the print by the former. In 1788 Morghen went to Padua, and is said to have been damaged. The impressions without the words ‘In Aedibus Rospigliosii’, and those taken before the retouches, are much more valuable than any of those taken afterwards. In 1790 Morghen visited Naples, and engraved a portrait of his father. The Neapolitan court wished to persuade him to reside at Naples in 1794, and offered him the post of a Salary of 600 scudi and free apartments for the engraver, under the condition that he should keep a public school; with the privilege of engraving what he might choose, and his prints remaining his own property.

The first print engraved by him in Florence was the Madonna della Seggiola. In 1796 he commenced the celebrated Madonna del Sacco, after Andrea del Sarto, and Raphael’s Transfiguration; but his time was much taken up by portrait commissions from the royal family of Florence. The first picture is in Florence; the second he engraved from a drawing by Tofanelli: he had commenced one from a copy by A. del Etra; but upon comparing this with the original he found important elements of gesture which had already done. This practice of engraving from copies and publishing the works produced as engraved from the original pictures, may be a custom with engravers, but it is a practice which is only in Latin art, and is not in the usual practice within the reach of the engraver, or unless the source be acknowledged upon the print. An engraver may commence his print from the print of another man if he has compared the copy with the original and found it to be exact; but an acknowledgment of the assisted availing is imperative in point of honour. A proof which is sold as a faithful copy of a certain work of art, and is only the copy of a copy, without reference to the original is a forgery. Jordan, the Russian engraver, who has just completed a very large and excellent engraving of the Transfiguration, was actually engaged thirteen months in the Vatican making his chalk drawing from the picture of Raphael on which his picture is based. The artist was pronounced by all who saw it as exact a copy as could be made. All engravers cannot do this, but they can all ascertain whether the drawings they work from are approved copies or not.

Morghen’s Transfiguration was not completed until 1812, when it appeared with a dedication to Napoleon, and the emperor invited the engraver to Paris, and honoured him with various privileges. In 1870 he made the lithography etchings of Hollande and England, which stayed for a considerable time in London, where he enjoyed the society, among others, of Boyle, Isaac Vossius, and Oldenburg, the secretary of the Royal Society. On the 2nd of October, 1871, he died, at Kiel, mourned by his widow, Cäsar de Déguing, senator of Lilbeck. She died in 1887, after having brought him four sons; of whom the second,
George Marquand, and the fourth, Eric George, died young; the first, Caspar Daniel, and the third, Frederic, survived their father.

In 1658 Morhof succeeded to the professorship of history; and in 1680 he was appointed librarian to the university. The latter charge to so devoted a reader was peculiarly gratifying. From the time of the loss of his wife, however, his health began to decline. In 1699 he was much weakened by a severe illness; and when he had partially recovered, in the spring of the following year he undertook an ill-advised journey to the mineral waters of Pyrmont, from which he never returned: he had got back as far as Lübeck, and there breathed his last, on the 30th of July, 1691, in the fifty-third year of his age.

Morhof was a very voluminous author. The account of his writings, published and unpublished, fills nearly fifty pages of the memoir by his friend Moller. His first production was a collection of twenty Latin poems, published together in 1657. This was followed by an academical dissertation entitled 'Diatribe de Morbis et eorum Remedia Juridica,' in 1658; and afterwards, among other works, by an octavo volume entitled 'Epigrammatum et Jocorum Centuria Prima,' in 1659; 'Diatribe Philologica de Novo Anno ejusque Ritibus,' in 1663; a curious defence of the miraculous powers claimed by the kings of England and France in the cure of the king's-evil, under the title of 'Principes Medicus,' in 1665; a volume of 'Miscellanea Poetica,' in 1666; another entitled 'Venerum, sive Epithalamionum, Liber,' in 1667; another entitled 'Funebres,' with an account of the funerals of lettuce at various times; a translation into Latin of several of Boyle's tracts, in 1671; 'Disputatio de Sole Igneo Academica,' in 1672; 'Epistola de Transmutatione Metallorum,' in 1673. The last-mentioned work is evidence that he believed in the philosopher's stone; in 1682, an octavo volume, in German, on the history of the German language and poetry ('Unterricht v...')...dichtes'); in 1684, 'Liber de Patavinitise Liviana'; in 1686, 'Otorium Divinorum, seu Carminum Sacrorum, Liber'; and the first and second books of his 'Polyhistor,' in 1688. After his death, and amongst other works of his, are published two volumes of 'Moralis Morhofi CVIII.' Quaestiones Chymicae, ex variis Autoribus Chymicis collectae; in 1697, 'Morfophi Opera Poetica Latina omnia'; in 1698, 'Morfophi Orationes et Prologiunna'; in 1699, 'Morfophi Dissertationes Academicae et Epistolicae.' For the works which he left in manuscript, mostly in an unfinished state, and which have never been printed, we must refer to the same pages of his biographer. They are far too numerous to be noticed here. So great a quantity of literary production in so short a life sufficiently attests Morhof's diligence and facility. His judgment, however, appears to have been hardly in proportion to his acquisitions; and even his learning was not remarkable for the high extent for its depth. Of all the mass of authorship to which his name is attached, his 'Polyhistor' is, we believe, the only portion that is esteemed by any esteem.

The full titles of his works are as follows: 'Polyhistor Literarius, Philosophicus, et Practicus. Of the Polyhistor Literarius,' intended to form the first volume, Two Books, as already mentioned, were published by the author himself in 1688. They were brought out in 4to, at Lübeck. The First is entitled 'Bibliothecarius'; the Second, 'Methodicus.' As reprinted in the last edition of the work they make together 688 pages. A Third Book, entitled 'Paraphrases,' was printed from Morhof's manuscript at Lübeck in 1692, with a re-impression of the two preceding Books. It extends to 160 pages. The remainder of the first volume, consisting of Book iv., entitled 'Geographia,' pp. 104; Book v., entitled 'Critica,' pp. 88; Book vi., entitled 'Oratorium,' pp. 82; and Book vii., entitled 'Poetica,' pp. 72, was compiled from notes of Morhof's lectures, by Moller and John Frickius, professor of theology in Bremen, and published as 'Morfophi Literarius,' in Five Books; and the 'Polyhistor Practicus,' in Seven Books; and published the completed work in two vols. 4to. In 1704. A new edition of the whole work was published in 1731. In his lifetime, a fourth edition and another edition in 4to., by the same editor, in 1747. All the editions have been published at Lübeck. With the ample indexes which Fabricius has appended (though the plan of notation is rather complicated), and with the corrections, additions and additions which it has received from his extensive and accurate learning, the 'Polyhistor' is still a useful survey of universal literature down to the middle of the last century.

As in almost all such works, however, some subjects which happened to be favourites with the author or his editors, are treated at disproportionate length, while others of greater real importance are too summarily dismissed.

Van Antwerp, or Sze Ander Wenzel, was born at Utrecht, about the year 1526, and was the pupil of Joan Schoorel. He obtained, while still young, a great reputation in Rome, especially as a portrait painter, and when the Emperor Charles V. went to Spain he accompanied him to Lisbon, to paint the future bride of his son Philip, the cardinal selected More. He was introduced to the Emperor, at Madrid, in 1553, painted Philip's portrait there, and, at the same time, painted that of Isabella, King John III., and the emperor's youngest sister, Queen Catherine of Portugal; for which he received 600 ducats and a very valuable gold chain as a present. Van Mander says that the usual price for such a portrait was 100 ducats, which at that time was a very large sum.

After a short interval, in 1554, More was sent to paint another bride of Philip's, Queen Mary of England: for this picture he was also richly rewarded, says Van Mander, and had a salary of 100l. per annum settled upon him, as painter to the King and Queen (Walpole says 100l. per quarter). More remained in England during the reign of Queen Mary, by whom he was probably knighted, and he painted several portraits of her and many of the English nobility of the time, some of which are at Hampton Court, and many others are still in the private collections of the descendants of the families. Some years after this, it is said, he went to Spain, and was more much inferior to Holbein. After the death of Mary, in 1558, More rejoined Philip in Spain, and appears to have lived on such terms of familiarity with the king, that, upon an occasion he painted a picture, Barbossa, on horseback with open hand on the shoulder, the painter ventured to return a blow with his malahitse, but he soon repented of his familiarity, and was heartily glad to escape with temporary banishment. Philip, however, sent to release him, and the king's messenger overtook More on his way, but the painter excused himself, not daring to trust himself again within Philip's power. Philip wrote to him in the Netherlands, and More, in 1564, paid a visit to Utrecht. More had entered the service of the Duke of Alva, who sent for him from Utrecht, and he was appointed by the duke receiver-general of the revenues of West Flanders, an appointment, says Van Mander, which so elated him, that he made a bonfire of all his painting materials at Utrecht, and made presents to all his friends. Some suppose from this that he gave up painting; but so far from this, he was constantly painting, especially portraits of women, for the duke, at Brussels, whose high position enabled him to reward the painter with a public office for private services. The whole of More's family was also richly provided for, by Philip, or by the duke.

More died at Antwerp, in 1561, aged fifty-six, while engaged on a picture of the Circumcision, for the church of Notre Dame there, and it was left unfinished. More painted chiefly portraits; and it is said, were few figures which he was not able to fill, but that he painted in the prevailing dry style of that time in the Netherlands, and with its hard positive colouring. Yet he made a good copy for Philip, of Titian's Danae, which is now at Madrid. There is much confusion about the dates of More's birth and death, some placing his birth in 1512; the above, however, is the account in the second edition of Van Mander, where it is fully explained in a note. More's portrait is in the Florentine gallery of painters' portraits.

(Van Mander, Het Leven der Schilders, &c., 1764.)

MORPFETH, a municipal and parliamentary borough in the township and parish of Morpeth, in the western division of Morpeth ward, in the county of Northumberland; 820
MOR

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yards by 58, is occupied as a nursery-ground. The town-
hall, a building by Sir John Vanburgh, was used as a ses-
sions-house until the erection of the present gaol.
There are a Roman Catholic chapel and meeting-houses for Pres-
byterianists, Independents, and Quakers. Among the most
famous literary worthies who have lived in Morpeth is
Horsey, the antiquary, author of the 'Britannia Romana,'
who was minister of the Presbyterian congregation from 1729 till
his death in 1791, at the age of forty-six. The truth of Morpeth
is not of much authority, but the town is noted for its
four limestone quarries, which supply stone for live stock on Wednesday: the weekly sale of oxen is
200; of sheep and lambs, 2500. There are a dispensary,
a savings-bank, incorporated in 1780, a Mechanics and
Scientific Institution. Races are held every year at the
last week in September, on a course on Cottong-wood, north of
the town. The race-course is about a mile and a quarter in
circuit.

Morpeth is a borough by prescription. Under the Mun-
icipal Corporations' Reform Act, it has 4 aldermen and 12
councillors, and is not to have a commission of the peace
except on petition and grant. The borough first sent mem-
bers to parliament in 1553. It returned two down to the
time of the Reform Act, when it was reduced to one. By
the Boundary Act its limits for parliamentary purposes were
enlarged, and the county boundaries to the extent already
already described. The number of registered electors was
in 1835-6, 354; in 1859-60, 363; in 1842-3, 428, namely
142 freemen and 286 ten-pound householders. Morpeth is a
rolling-station for the northern division of the county of
Northumberland.

The town of Morpeth is not noticed in history till the
reign of John (a.d. 1199), who granted a charter for a fair
and market; but it is possible that John a.d. 1066 had
the barons. In the civil war of Charles I., Morpeth
Castle was occupied by a body of the Scottish Covenanters,
from whom it was taken in 1644 by the Marquis of Montrose.
The late Dr. Morpeth, one of the eminently distinguished
natives of Morpeth. The town gives the title of Viscount
to the Earl of Carlisle, and by courtesy to his eldest son.

The living of Morpeth is a rectory, with the perpetual
curacy of Upleatham, one of the several manors which
constitute the archdeaconry of Lindisfarne, in the diocese of
Durham: the annual value of the benefice is 161l. with a glebe-house.

There were in the borough in 1833 thirteen day-schools
with 448 to 456 scholars, viz. 269 to 270 boys and 188 girls;
giving less than one-eighth of the population under daily
instruction. Of the day-schools one, with 43 boys, was
a free grammar-school founded and endowed by Edward VI.: the
building having been erected at the expense of the
earliest and the wealthiest of the town.

(Parliamentary Papers; Hodgson, 'History of Northum-
berland.')

Morton, Thomas, was born in 1764, in the county of
Durham. His parents having dwelt while he was young,
his uncle, Mr. Madison, a stockbroker in London, took
him into his care. He was educated at the Soho Square
Academy, celebrated for the annual theatrical performances
of the pupils, several of whom became distinguished authors.
He was afterwards entered a student of Lincoln's Inn, but
the fondness for theatrical amusements which he had contracted
at school was not to be subdued; he became a constant play-
goer, and directed his studies to the drama rather than to
the law. Having written a dramatic piece which was favourably
received, he at once entered upon the legal profession without having
been called to the bar.

Morton thenceforth devoted himself entirely to play-
writing, and became one of the most successful of modern
dramatists. Such was the evidence of managers in his power of pleasing an audience, that when his
comedy of 'Town and Country' was to be brought out in
1807, Mr. Harris, the leasee of Covent-Garden Theatre, gave
him 1000l. for the first three months before the rehearsal, taking on himself all risk of failure. Out of four-
teen or fifteen comedies, comic-operas, and farces, five or six
still continue to be stock-pieces at almost every theatre where
they are produced.

The following is a list of his plays, perhaps incomplete as
to two or three of the later productions: 'Columbus,' 1792;
'Children in the Wood,' 1788; 'Zorabki,' 1796; 'Way to
Get Married,' 1796; 'Cure for the Heart Ache,' 1797;

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'Speed the Plough,' 1798; 'Secrets worth Knowing,' 1798; 'The Blind Girl,' 1801; 'School of Reform,' 1803; 'Town and Country,' 1806; 'Roland for an Englishman,' 1812; 'School for Grown Children,' 1826; 'Invincibles,' 1828.

Morton was a respectable man, of regular and orderly habits. His conversation was sprightly, and abounded in anecdotes; the knowledge of cricket tops all a companion; he was a constant attendant at the cricket-grounds, where he enjoyed his favourite exercise. He died March 28, 1838, in his seventy-fourth year, leaving a widow, three sons, and a daughter.

Morton's manner of writing left much to be desired; they only by reading them, his uniform and great success will probably be matter of surprise; to those who are engaged in dramatic writing, it must be no less a matter for investigation. Morton has not the correct construction of a dramatic artist, reduced deficient in the highest qualities of the art. He gives no true representations of character either in its broad and strong markings or in its nicer discriminations; he shows nothing of the real operation of motives, nothing of the genuine workings of feeling: his serious and his comic characters are alike artificial and exaggerated; they are strictly and peculiarly stage-characters, and anything resembling them in real life will rarely if ever be met with. But he has extraordinary dramatic tact: he foresees distinctly what may be effected in the performance, and the situations, as well as the characters are admirably contrived for displaying an actor's skill, abundant in his imaginative powers and bursts of passion, overflows of excessive liveliness, or exhibitions of strange peculiarities, such indeed as have never been witnessed, but which, when well performed, are exceedingly amusing. He has neither the wit and little humour, but is never languid or heavy; and the very speeches which when read produce a smile of contempt or a feeling of incredulity, in most persons would, to Lewis, Murray, Quick, Haward, Emery, John Kemble, and Edmund Kean, the medium by which they were enabled to exhibit the triumphs of the actor's art.

(Gentleman's Magazine, 1838; Biographia Dramatica, by Baker, Reed, and Jones; Inchiata's British Theatre.)

MOSES, GEORGE MICHAEL, R.A., gold-chaser and enameller, the first keeper of the Royal Academy of Arts in London, was born at Schaffhausen in Switzerland, in 1704. He came young to London, and was first employed as a chasing in gold and also in brass for the ornaments of cabinet-work, in which he obtained a great reputation. He was also an excellent medallist and a good painter in enamel, but he did not carry his works in this respect much beyond enamels for watchcases, in one of which he painted, for the king, George III., portraits of the Prince of Wales and the Bishop of Osnaburg. He was long keeper at the Royal Academy, and who by virtue of his office is principal teacher of the students: the superintendence of and the instruction in the antique aca- demy are the principal duties of the keeper. Before the foundation of the Royal Academy Mr. Moses was for many years treasurer and manager of the private academy in St. Martin's Lane. He died in the beginning of 1783, and Sir Joshua Reynolds wrote an eulogium upon him, which is printed in his Works. Lady Blessington says, Sir Joshua says Sir Joshua, Moses was the first in his profession; and he had a universal knowledge in all branches of painting and sculpture. ' He may truly be said,' he continues, 'in every sense to have been the father of the present race of artists. Hogarth, Rysbrack, Roubiliac, Wills, Ellis, and Vanderbank, were Moses's early companions, all of whom he outlived.

Mary Moses, his only daughter, was a very distinguished flower painter, and is the only lady, besides Angelica Kauff- man, who has ever been elected an Academician: she became afterwards Mrs. Lloyd. Miss Moses, says Smith, in his Life of Nollekens, was somewhat precise, but was at times a most charming woman. She was the daughter of Mr. Moses, a letter was sent to him by his daughter to Mrs. Lloyd, the wife of the gentleman to whom she herself was afterwards married; and the other to Fuseli while in Rome, of whom she said was said to be an admirer. In one of these letters according to the absurd figurations of the beginning of the reign of George III., she says, 'Come to London and admire our plumes; we sweep the skies! a duck's coat is six feathers, a lady four, and every milkmaid one at each corner. Now a monstrous cap, I pray tell your operator, that your hair must measure just three-quarters of a yard from the extremity of one wing to the other. The second is chiefly on Lord Chesterfield's advice to his son; she says to her father, 'You have read Chesterfield's letters, give me your opinion of them, and what you think of his lordship: for my part I admire wit and admire good manners, but at the same time, I should detest Lord Chesterfield's advice."

Believe me, if you have met with more amusing letters, I should wish to have seen them; if you have not, I am happy to have been your family reader."

Reynolds was like himself in pictures which you have seen; Gainsborough beyond himself in a portrait of a gentleman in a Vandyck habit; and Zoffany superior to everybody in a large picture of a street in London. In reading these two other figures, Subtle and Face. Sir Joshua agreed to give a hundred guineas for the picture; Lord Carlisle half an hour after offered Reynolds twenty to part with it, which the knight of knighthood, the eminent and highly thought of, agreed, and tendered it to the lord, and the encomium to his brother artist. He is a gentleman! Angelica made a very great addition to the show, and Mr. Hamilton's picture of Britis parting from Achilles was very much admired; the Britis in taste, &c., &c., as usual.

Mary Moses decorated an entire room with flowers at Frog- more for Queen Charlotte, for which she received 900l.: the room was called Miss Moore's room. After her marriage she practised only as an amateur: she died at an advanced age in 1819. West was reinstated in the chair of president of the Royal Academy in 1808, then in 1812, and again in 1828, and when Fuseli was taxing with having given it, he said, says Knowles, his biographer, 'Well, suppose I did; she is old and ugly, and does not; and is not one old woman as good as you and me?' West and Fuseli were the most celebrated men in the MOSQUITO COAST. This country, which has now taken a place among the independent countries of the American continent, is situated between 11° and 17° N. lat., and 85° and 86° W. long. Along the coast of the Caribbean Sea it extends from the mouth of the Roman River (15° 6' N. lat. and 85° 46' W. long.) to Punta Gorda and the mouth of the Rama River (11° 30' N. lat. and 83° 47' W. long.). The sovereign of the country also claims the country farther south, lying between Punta Gorda and the Chiriqui Lagoon, but the states of Costarica and Nicaragua dispute those claims. The line which separates the territories of the Mosquito Coast from the states of Honduras, Nicaragua, and Costarica, is not well determined; it is however presumed that it runs along the chain of mountains which traverse this part of America from south-east to north-west, and which is very imperfectly known. In such circumstances we must presume that the estimate of the area of the country, which without the disputed parts is stated to be 26,000 square miles, and including the disputed districts, 34,000 square miles, is only to be considered as a vague approximation to the truth.

The most northern portion of the coast-line of this country, or that which extends from the Roman River to Point Patock, is high, but the remainder of the shore is low. Along this low line of coast a series of keys occur from ten to thirty-five miles from the main. There are some that have not been experienced navigators, but shelter that narrow part of the sea which lies between them and the mainland from the ocean swell, so that it can be navigated without danger by coasting vessels, as the depth of water varies between seven and fourteen fathoms. Vessels sailing from Jamaica to Cape Gracias a Dios pass between the islands of Old Providence and St. Andrews, and enter the above-mentioned channel by the wide opening in those parts between the keys.

From the mountain-range which forms the western boundary of the country several lateral branches run off, which terminate at the distance of eighteen to twenty-four miles farther to the main. These branches are the highest when from 1000 to 1500 feet above the sea-level, but they are very imperfectly known, with the exception of the most northern, which comes close up to the shore between the Roman River and Cape Patock. In these parts are several high peaks, as Carib Peak, which is about 4000 feet, the Poyas Peak, 3500 feet, and the Sugar-Loaf, 3000 feet above the sea-level.

Along the low coast the country is a level plain, slightly elevated above the sea, but on proceeding farther inland it rises in terraces, and here the plain is frequently interrupted by depressions and by elevated tracts which are connected with the sea by narrow passes. These passes are usually scooped out by the currents of the rivers. The lower por-
tions of the country are savannahs, without trees and frequently without bushes, but where the country rises and forms hills, it is overgrown with trees. In the vicinity of the sea the soil of the country is sandy and rather shallow; nevertheless it produces excellent grass, which is ascribed to the waters which inundate this part of the country during the rainy season. Farther inland these plains have a richer soil, which is benefited by the rich deposits of sand, and the large piece of black mould. The higher ground, especially near the banks of the river, and the lagunes, have a large mixture of sand, and these tracts are mostly overgrown with pitch-pine, fir and larch trees, which are mixed with mould, and in the woods which cover them a large number of mahogany-trees, cocoa-trees, casouchette, and other valuable trees are met with. The whole country, as is known, presents a continual alternation of wooded lands and prairies.

The Mosquito Coast is drained by numerous rivers, which south of Cape Gracias a Dios run mostly to the east-south-east, but north of it they run north-east. Many of them are navigable to a considerable distance from their mouths, and it appears that rapids are only found near their sources. But the navigation is frequently impeded by the trees which are brought down during the rains, and when the water descends, they are lodged in the bends of the river, where they are accumulated so as to form a dyke across the current. They are partly removed by the freshest, but are soon replaced by others. Most of the lakes are divided by low, 24-5 feet, harbours, which however, are only accessible to small vessels, as all those which do not fall into lagunes have bars across their mouths, on which at low-water there are in general only from one to two feet of water. In the rainy season the bars are partly removed, but the eastern trade-winds soon throw them up again, when the rivers have sunk to their lowest level, and the diminished force of the current cannot carry the matter far into the sea. The Belfield River, which falls into the lagune of the same name (12° N. lat.), is said to run to upwards of ninety miles, rises within the state of Nicaragua. Wanks or Segovia River also rises in Nicaragua, where it is called the town of Matagalpa and Segovia. It is said to run 250 miles. Its mouth is near the Bay of Cape Gracias a Dios, and has a bar; but the river may be entered by a canal which unites it to the sea. It is said to be navigable to the boundary-line of Nicaragua.

The lagunes are a peculiar feature of this country. They are not shallow, stagnant collections of water, but deep lakes, connected with the sea by one or more straits, by which the tide enters them. They generally receive one stream, frequently several streams, and therefore a current is always observable, which sometimes runs strongly. Near the entrance of the lagune, and especially near the mouths of the rivers, it is quite sweet. These sheets of water always extend parallel to the coast, and frequently approach one another, so that the natives in their canoes of 10 or 15 feet long and 3 feet wide are not encumbered by the shallow water of the lagunes. The lagunes form good harbours, but towards the middle of the dry season bars are found across the entrances, which however have much more water than the bars of the rivers. Owing to this circumstance, and because the lagunes do not exhalate any dangerous vapours, the settlements have generally been made on their banks. The most extensive, from south to north, are Belfield Lagune, into which the Belfield River falls,—this lagune is upwards of fifty miles long, and from eight to fifteen miles across, and has from three to four fathoms water on its bar; Pearl Key Lagune, where the sunken reef appears from one to three miles wide; the bay at the Cape Gracias a Dios, which is of small dimensions, being only four miles long and three wide, which forms a good harbour, with 22 feet water at the entrance, and 17 feet in the innermost part; and Carataska Lagune, west of Cape Gracias a Dios, which is thirty-six miles long and from eight to ten wide, and from two to three fathoms deep: the bar across its mouth has only eight feet water to the entrance of the lagune, which separates the lagune from the sea is a narrow channel, from two fathoms to two and a half deep. Four rivers of moderate size fall into this lagune.

Vegetation is more luxuriant than in any country between the tropics. The grasses which with the savannahs are clad often attain a height of five or six feet. The number of vegetables which are cultivated with success is great; the most common are yams, manioc, cassava, sugar-cane, rice, maize, tobacco, sweet potatoes, yams, casava or mandioc. Coffee, cocoa-nut trees, palm, oil trees, and orange and lime trees are planted; the woods contain a great number of trees whose fruits are edible, or which afford timber and cabinet-woods, or are useful in other respects. Such are the pine-apple, cabbage tree, banana tree, tan palm tree, caoutchouc tree, avocado pear, pimento tree, live oak, sapotilla tree, papaya tree, calabash tree, mammea tree, guava tree, mango grove, cacao tree, silk cotton tree, mahogany tree, cedrelle, yellowwood tree, ironwood tree, dogwood, ebo tree, casheew tree, lassa tree, mango, jacaranda, cocoanut, maguey, and brasilletto tree, and a few others. In the woods the indigenous plant is found wild; vanilla and sarsaparilla are gathered, the last mentioned to such an extent as to afford a considerable article of export.

Cattle are very numerous and of a large size; horses abound, but are not kept, but boats are abundant. Fowls are numerous. Several species adorned with brilliant plumage are found near the rivers, where also the jaguar and the tiger are met with. Other animals are the racoon, the opossum, grey squirrels, deer, and the manati. Alligators are found near the embouchures of all the rivers, but of these very large according to their different species. They are distinguished by its size, and is eaten by the natives. There are several kinds of snakes, four of which are stated to be poisonous. The land-turtles belong to the species Testudo tabulates, and are sometimes more than a foot long, but their size varies from one to two feet.
flesh is less esteemed than that of the sea-turtles, of which great numbers are always to be met with on the keys opposite the coast of Casbar, the 227 Ceylonese resort, where they take especially green turtles (Chelonia midas) and hawks-bills (Chelonia caretta). The birds are imperfectly known. Among them are different kinds of pelicans, the caya (Pelecanus occidentalis), humpbacks, the black vulture or John crow (Cathartes hartii), and several kinds of pigeons. Several kinds of ducks and the pelican (Pelecanus fuscus) have been noticed. Fish is abundant in some of the rivers. Fifty miles up the course are caught in the sea, thirteen in the lagunes, and perhaps more than ten in the rivers. The shark and the saw-fish (Pristis antiquorum) are frequent in the sea and the lagunes, and along the coast the mygale (Blaas or Bande) is not uncommon. Crabs, crawfishs, and some kinds of lobsters are frequently met with. Honey is frequently used as sugar. Mosquitoes are not uncommon, which is ascribed to the strong winds that generally blow. Sand-flies, sand-dresses, and centipedes (Scolopendra morrisoniana) are common.

The majority of the inhabitants do not materially differ from the other savage tribes of America. But the ruling tribe, called Samboos, show evidently a strong mixture with the negro. The colour of the other tribes is a clear brown; but that of the Samboos is much darker, approaching sometimes to black; and whilst the black hair of the forerunner is that of the negro, the Samboos in some cases have a redder countenance. The Samboos have also thicker lips, and are stronger built. There exists a tradition, that a vessel containing a great number of negroes was cast away on this coast, that the negro males were cast ashore, while the women and negro girls were carried away. Among them are also a few Caribbees, probably the descendants of those who, in 1797, were sent from the island of Dominica to that of Rostan, and who afterwards emigrated to the continent of America. They are shorter in stature than the other tribes, but stronger built, have a somewhat convex nose, and are distinguished by greater vivacity and industry. All the tribes, though they speak different dialects, distinguish themselves from other nations by the name of Miskitos, which the Europeans have changed into Mosquitoes. The natives of this country live mostly on the produce of their fields, on which they cultivate maize, cassava, yams, plantains, pineapples, coconut-trees, and some other fruits; but they eat also large quantities of fish, and the flesh of the wild animals which they kill, or of their cattle. They show considerable skill in making canoes, of which the larger kind, called dories, are frequently six or eight feet wide, and from thirty to forty feet long. They are made of a single trunk of a tree. Though in general very indolent, the natives are good seamen, and are esteemed by the Spanish officers who have employed them and their canoes. They have also acquired some skill in weaving cotton-stuffs.

The commerce of the Mosquito Coast is carried on by a few vessels, which are settling. They receive European goods for the market, commonly from Belize, but also by vessels sent from Jamaica and some English settlements in the neighbourhood. Vessels from Jamaica and the Cayman Islands to the keys along the coast to catch turtles, also import occasionally a few articles. In this manner the natives are supplied with some coarse linen and cotton stuffs, with very indigent guns, gunpowder, balls and shot, some cutting instruments, as axes, knives, blades, iron kitchen utensils, fishing-hooks, glass beads, gossamer hats, American tobacco, pipes, flints, girdles, bows, and mugs of earthenware, rum, brandy, and liquors. These articles are exchanged for cattle, especially cows, turtle-shell, hides and horns, cassava-rolls, vanilla, caustichoue, gummni, cacao, pimento, castor-oil, nuts, mahogany, fustic, and some articles from the central American states: as cochineal, silver, gold-dust, and silver and gold. At the keys the tributaries of the rivers have some intercourse with Honduras and Nicaragua.

This coast was one of the first places where the Spaniards tried to form a settlement. Alonso de Ojeda and Diego de Nicuesa landed here in 1512, with about a thousand adventurers; but the natives resisted the invasion with great perseverance, and the Spaniards were compelled to leave the country after having lost a considerable number of men. When the Spanish entered the country in 1525, several of the remote districts have had some intercourse with Honduras and Nicaragua.

All these events increased the hatred of the natives to the Spanish name. When the buccaneers were in power in the seventeenth century, they were received by the Mosquitoes with open arms. In the country as the safest retreat when they were pursued by the Spaniards. By means of the buccaneers it appears these people were brought into connection with the English, and the first protection given to this coast by the English, was confirmed by a treaty in 1670. The first settlement of Englishmen on this coast dates from 1750, when some families established themselves at Cape Gracias a Dios on Black River and BЉveda. They were not in a certain degree of prosperity, especially by smuggling with the inhabitants of the Spanish colonies, the English government sent them some persons invested with authority, and erected a few small forts. These were noticed, early enough to be engaged to abandon these forts and to compel the colonists to leave the country. This was done, but several families established on BЉveda's Lagoon did not obey the order of their government, and remained there. It is stated that in 1770 the number of English settled on the Mosquito Coast amounted to 1400 individuals. These people were entirely abandoned by the peace of 1783, and were obliged to go to Belize. Soon afterwards the Spaniards made the last attempt to conquer the coast, by taking possession of the fort on Black River, which the English had abandoned. But they were totally defeated by the natives. England again took the coast under its protection, in 1854. The Spaniards acquired their independence, that of Nicaragua claimed the Mosquito Coast as a portion of its territories, but these claims were rejected by England and the king of the Mosquitoes. It was then that Spain, in 1856, treated the king as an independent sovereign in 1817, when he paid a visit to the town of Guatemala. It appears that at present the claims of the state of Nicaragua have been given up, with the exception of the Spanish portion of the country lying between Punta Gorda and the Lagunas of Chiquiri. Meanwhile the king, whose power is absolute, has ceded different districts with almost sovereign power to some Englishmen, who have formed settlements on BЉveda's Laguna and on the banks of Black River, but other portions have not yet been settled. It is probable that in course of time this country will become an English colony, considering that the native population has lately greatly decreased, nearly half of it having been swept away by the small-pox.

(Henderson's Account of the British Settlement of Honduras,) &c.; Robert's Narratives of Voyages and Explorations on the East Coast and the Interior of Central America; Young's Narrative of a Residence on the Mosquito Coast during 1833-1841; and Bericht liber die Untersuchung einiger Theile der Antilibern am Rande von der dazu erlauterten Commission, Berlin, 1845.)

MOULFON, [Sheep, P. C.] MOVING POWERS. The means employed to give motion to machines is generally of the cases in which the force of gravity is applied directly, as in turning the cylinder of a clock, are the strength of men and animals, the pressure of the atmosphere, the expansive force of steam, and the action of wind or water; it is even probable that the recently posited actions of the galvanic fluid and of fired gunpowder will in time be numbered among motive forces for impelling carriages, vessels, or machines. The first and second of the powers above named have been treated under Animal Strength, P. C. S. and Atmospheric Railway, P. C. S.; and the force of steam under Steam-Engine, P. C. P., p. 478 et seq.

The intensity of a moving power is always estimated by the amount of the resistance which is overcome and the space through which the equivalent of that resistance is conveyed, or raised vertically, in a given time. Thus, in the article on Animal Strength [P. C. S.] it has been shown that a man, a horse, &c. can do work in the course of a year, or, to put it another way, in the course of a year, or, to put it another way, supposed to be continued during all the time that the machine is at work.

Originally the larger kind of engines, except such as were impelled by sails, were of wood, and were very expensive; and when other agents were employed, the gross effect of the
engine was estimated by the number of horses to whose action it was equivalent; but the intensity of horse-power is very variable, and some inconvenience was at first, on that account, experienced in estimating the relative values of engines. In order to establish, conventionally, this dynamical unit, Messrs. Boulton and Watt ascertained from trials purposely made that a strong horse can draw 125 lbs. at the rate of 3 miles per hour during 8 hours; therefore the measure of the power may be expressed by \(3000 \text{ lbs.} \times 3 \times 8\) or, multiply by 5280, the measure is 15,840,000 lbs. raised one foot in an equal time. This product, being divided by the number of minutes in 8 hours, gives the rate of power for one horse equal to one foot per minute continually; and the last number is now universally adopted as a measure of the intensity of the power of a horse. Therefore when an engine is said to have the power of any number \(n\) of horses, it is understood that it is capable of raising 38,300 \(n\) pounds' weight to the height of one foot in every minute during the continuance of its action.

The method of estimating power by a weight carried or raised through a certain space in a certain time is capable of being applied to all engines: thus, in drawing a carriage along a road, the resistance of the carriage must be equivalent to some weight; and the re-action of water against the paddles of a steam-boat may be equally represented by a certain weight which, if it were lifted by the wheel, would oppose a resistance equal to that of the water. For the useful force of steam-engines in terms of the volume of water evaporated, the pressure of the steam, the length of the stroke, etc., see Steam-Engine, P. C.

Wind and water are employed as prime movers by means of the momentum arising from their velocity; and the latter, occasionally, by the pressure arising from its weight. The manner in which the force of wind is made to act in giving motion to vessels on the surface of water has been fully explained under Sail, P. C., and, in producing the revolutions of windmill sails, under Wind-Sail, P. C.; it is intended therefore, in this place, merely to explain the method of forming an equation of equilibrium for the power of an oar in giving motion to a vessel, and to show how the force of waves on the paddles or float-boats of wheels which are turned by that element.

Let \(M N\) represent one side of a vessel, \(A B\) the position of the oar when its blade enters the water, and \(E\) the fulcrum or side of the rowlock against which it presses; then the vessel will remain at rest in the water if the oar, during the time that a stroke of the oar is being made, let \(F\) be the position of the fulcrum and \(C D\) the position of the oar at the end of the stroke; if the vessel had remained at rest, the oar, at the end of the stroke, would have had the position \(c\), of which may be considered as parallel to \(C D\).

Now, \(B\) being the centre of percussion on the blade of the oar, the actual motion of \(B\) (supposed to be parallel to the keel of the vessel) may be represented by \(DB\) while the movement of the vessel is \(EF\) (\(= DT\)); and therefore \(DB\) represents the relative movement of \(B\). The lines \(BD\) and \(DB\) being proportional to the velocities of the oar and vessel, which velocities we may represent by \(\alpha\) and \(\beta\); \(\alpha - \beta\) will express the relative velocity of the oar, and the effective power of the latter will vary with \((\alpha - \beta)^3\). Let \(a\), in square feet, be the area of the blade of an oar, and let the pressure of water against a square foot of surface be 14 lb. when the velocity is 1 foot per second; then \(\frac{a}{2}(\alpha - \beta)^2\) will denote the force of the oar.

If, for simplicity, the prow of the vessel be supposed to have the form of a triangle with plane faces meeting in a vertical line, or cut-water, on putting \(a\) for the area of the whole prow and \(\theta\) for the inclination of each face to a vertical plane passing through the keel, we shall have

\[
3a' \sin \theta \cdot \alpha^2
\]

for the resistance of the water against the prow. Therefore, if \(n\) be the number of oars all of which are supposed to act with equal forces; we have, when the vessel has acquired a terminal velocity,

\[
\alpha = \frac{3n}{8} \sin \theta \cdot \alpha^2
\]

from which \(\alpha^2\) may be found. The velocity of a vessel moved by oars is, however, found to increase in a less ratio than the number of oars.

The power of the oar in rowing appears to be diminished by the reaction of the feet of the rowers in pressing against the foot-boards; this has a tendency to force the vessel backwards, but it is compensated by the greater velocity which the centre of percussion of the vessel obtains. The oar is, however, in losing in overcoming the inertia of the oar, and in bringing it forward against the air; this last force is considerable when the vessel is rowed against a high wind, though it is to a certain degree diminished by the practice of feathering the oars.

The above equation might be used to determine the velocity of a vessel impelled by steam, in which paddle-wheels are employed. If it were possible to determine, early, the value of \(na\), or the number of square feet of paddle which, on both sides of the vessel, are at every moment acting efficiently against the water: the value of \(\alpha\) would be, of course, determined by the number of revolutions with which the wheel makes in a given time; and it should be expressed by the number of feet per second which the centre of percussion in the paddle moves through in turning about the axle.

The momentum of the vessel being horizontal against a plane, such as a flat-shaft of an undershot wheel, depends on its velocity, on the area of the surface with which it comes in contact, and on the obliquity of that surface to the direction of its motion; and, in estimating the effect of water on such a wheel, it is necessary to determine from the dimensions of the channel and the velocity of the water in it the weight of water which descends vertically through a certain height, as one foot; the product of this weight multiplied by the height actually descended, being compared with the product of the number of pounds which the wheel can raise to a certain height in the same time multiplied by the height, expresses the ratio of the power to the effect. From many experiments Mr. Smeaton concluded that, when the quantity of water expended is the same, the useful result varies nearly with the head of water, or with the square of its velocity.

The power of an overshot wheel is estimated by the product of the weight of water expended in a given time multiplied by the whole weight of its descent, that is, by the sum of the diameter of the wheel and the height of water in the reservoir above the top of the wheel. The useful effect of an overshot wheel is said to be nearly double that of one which is undershot.

In determining the power of water on breast-wheels, it is customary to consider the pressure of a wheel as equal to the weight of an undershot and of an overshot wheel; and its effect is conceived to be equivalent to that of an undershot wheel whose head of water is equal to the difference in height between the surface of the water in the reservoir and the height of the water impinging on the wheel, together with the effect of an overshot wheel whose height is equal to the difference between the point of impact and the level of the tail-water.

MUCID ACID. [CHEMISTRY, P. C. S.]

MUCIUS SCAEVOLA. [SCAEVOLA, P. C.]

MUCUNA, a genus of plants belonging to the natural order Leguminosae. The caules is campanulate bilabiate, with two very caducous bracteoles as long as the tube; the upper lip broad, entire, and obseous; the lower lip trident, with acute segments. The corolla is papilionaceous, with a corolla vexillum incumbent on the wings, much shorter than the wings and the keel, and without callostylles. The stamens are disiahiths, with five of the anthers oblong, linear, and the other five ovate and hairy. The seeds oval, roundish, or reniform, with a narrow, oblong, or linear hilum. The species are climbing herbaceous, with phylline and trifoliate leaves and axillary racemes, which hang down when bearing fruit.

\(M. prurieta\), Cowitch, has purple flowers in compact ovate racemes, leaflets hairy beneath, the middle one rhomboid and obtuse, the lower ones dilated to a sessile ovate and the other five ovate and hairy. The seeds oval, roundish, or reniform, with a narrow, oblong, or linear hilum. The species are climbing herbaceous, with phylline and trifoliate leaves and axillary racemes, which hang down when bearing fruit.

\(M. prurieta\), Common or Stinging Cowitch, has entire ovate acute leaflets, smooth above, hairy beneath, the lateral ones oblique at the base, the middle one slightly rhomboidal
The racemes are from 1 to 1½ feet long, lax, and many-flowered. The calyx is hairy, pink, with narrow laciniate segments which have a diagnostic smell, the vexillum is flesh-coloured, the wings purple or violet, and the keel greenish white. The legumes about 3 inches long, the thickness of the finger, closely covered with strong brown hairs, are oblong, variegated with black and white hilum. A mixture of the hairs of these two species form the Cowitch of commerce. The ripe pods are dipped in syrup, which is scraped off with a knife, and when the syrup is removed, which is the result of the growth of the hairs becoming mixed with it, it is used as a medicine, and is considered a good astringent, as it occasions no uneasiness. It is given from a tea-spoonful to a tablespoonful in the morbus choleraeum. When applied to the skin, produce an intolerable and painful itching. A vinous infusion of the pods, twelve to a quart, is said to be a certain remedy for dropsy. A strong infusion of the roots, sweetened with honey, is used by the native practitioners in India in cases of cholera morbus. It is likewise considered a powerful diuretic.

M. urens has racemose flowers and legumes clothed with stinging bristles; the leaflets have a shining tomentum beneath. The flowers are large, white or yellow, with the lower edge of the wings red. The seeds, from their resemblance to an eye, are called by the French Xyces yeux. The name has been proposed for the genus, but the seed has the name œil-œuf in our colonies in the West Indies, where the species is a native.

A rich soil suits these plants, and they are easily raised from seed. They are not worth the trouble of cultivation, except for botanical gardens.

(Don, Gardener's Dictionary; Lindley, Flora Medica; Bentham, Outline of Botany, P. C., 1856; MULE, MULLE-JENNY. [Cotton Spinning, P. C., p. 96; Cotton Manufacture, P. C., p. 98.]

MULGE DIUM, a genus of plants belonging to the natural order Compositae, the suborder Liliiflorae, and tribe Cicurineae, which subtribe is called Herzicæ. It has many-flowered heads, a double involucre, the inner of one row, the outer of short lax inbricated scales; the fruit compressed, constricted above, and terminating in a dilated disk; the outer rows of the pappus rigid and brittle. There are several species of this genus.

M. alpinum, has glabrous, lyrate at the base, arrow-shaped leaves, the terminal leaf large triangular-hastate acute; the stem simple, heads racemose, bracts, peduncles and involucres glandular, hairy; the fruit oblong, not attenuated, with many ribs. This plant has blue flowers in small numerous heads, with yellow disk, 2½ feet high. It is perhaps a true species or a hypogeous form of one; it belongs to the genus M. alpinum, and is the only British species of the genus. It is the Sonchus carvulans of Smith in the English botany. The only locality in which it grows in Great Britain is the mountainous districts north of the Forth.

M. floridum is a native of America, and on account of its excessive bitterness, is called Gall of the Earth.

(Rabbiton, Manual; Lindley, Vegetable Kingdom.)

MULLER, Peter, a German engraver, known for his numerous prints, after drawings by the early Italian masters. He was born at Florence towards the close of the eighteenth century, and was the pupil of A. Scacciat, whom he assisted in a series of engravings after the most beautiful drawings in the Florentine Collection. Forty-one only were executed during Scacciat's life; the remaining fifty-nine were executed entirely by Muller. These were succeeded, in 1775, by a collection of prints after drawings of the earliest masters, from Cambiace to Pietro Perugino, under the title Istoria Pratica dell Incominciamento e Progresso delle Incisioni in Europa. In 1780 his name appeared in a list of disegni originali esistenti nella Galleria di Firenze; which was followed, in 1780, by a still more interesting work on the five great Italian schools of painting, Segni e Stampe delle Cinque Scuole di Pittura Italiana....

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MULLER, the name of two very celebrated German engravers, father and son.

MULLER, Johann Michael von MULLER, the elder, was born at Bernhausen, near Stuttgart, in 1747. His father, who held an official situation under the government of his native country, wished to educate Muller for the church, but the youth showed such unusual talent in the arts, that in 1764 he entered the well-known Academy for the Arts at Stuttgart, that the Duke himself urged him to follow art as his profession. Accordingly, in 1764, Muller, under the immediate patronage of the duke, undertook the engraving of the new edition of the Encyclopædia, recommended him to follow engraving, which he pursued for six years (1770-76), at Paris, under Wille, with such success that, in 1776, he was elected a member of the French Academy. He remained in the service of the Duke of Saxe until 1780, when he went to Paris, and was admitted to the academy. His last work in Paris was a good portrait of his master J. G. Wille. The first work which he completed at Stuttgart was Alexander, Conqueror of Himself, after Flinck, which he took, in 1781, to Paris to be printed, not venturing to work off so valuable a plate at the then inexperienced copper-plate press established by himself in Stuttgart. In 1785 he was invited to Paris to engrave the portrait of Louis XVI, painted in 1774 by Duplessis; but the picture from which Bervic engraved the same king was painted ten years later, and Bervic's is accordingly a more characteristic portrait of what he eventually was. In 1802 Muller was elected a member of the French Academy, and in 1803 was one of the artists who conducted the exhibition of the works of art for the Société des Arts. In 1808, he was elected a corresponding member of the Academy of Sciences at St. Petersburg, and in 1818 was elected a member of the French Academy. He died at Dresden in 1818, and in the same year a biography of him was published in the Schwäbische Merkur, No. 71.

Muller engraved only thirty-three plates, a small number, but some of them are the large and elaborate works; they are, however, chiefly portraits. His principal works, besides those already mentioned, are—the Battle of Bunker's Hill, after Trumbull, engraved in 1789; the Madonna della Seggiola, for the Musée Français, engraved in 1804, by many considered superior to the print of the same subject by Raphael Morghen; a St. Catherine, with two Angels, after L. da Vinci; and the portrait of Schiller, after A. G. Christian Friedrich von Müller surpassed his father, but, owing to the extreme shortness of his career, his prints are even less numerous than those of the elder Muller. He was born at Stuttgart, and was marked in his youth by a marked facility for his art. He removed to Dresden in 1816, aged only thirty-three. He was carefully educated by his father in all those branches of the arts which, by his own experience, he knew to be requisite to constitute an excelent engraver; and in 1809 he had the good fortune to spend his studies in the great world at Paris, where at that time the majority of the finest works of art in Europe were collected together in the Louvre. Here, in 1808, Muller engraved the St. John, which he dedicated to the Revolutionists, after Domenichino, in which the eagle brings him his pen; and Adam and Eve under the Tree of Life, after Raphael. He was commissioned shortly afterwards by Ritter, a printseller of Dresden, to engrave his last and greatest work, the most sublime of all the paintings of Raphael, the Madonna di San Sisto, in the Dresden Gallery. He was wholly occupied for the remainder of his short life on this plate, which he meant to complete, but he never saw a finished print from it. He removed to Dresden in 1814, and was appointed professor of engraving in the academy there. His existence seems almost to have been wrapped up in the execution of this plate; he was occupied with it at night and at the table, and the infallible result of such constant application and excitement soon made its appearance; he was in vain advised to desist for a while from his work. He completed the plate in 1816, and sent it to the academy; but the public excitement which supported him departed also; he had just strength enough left to admit of his being carried to the Sonnenstein, near Pirna, where he died in 1816, only a few days after the arrival of his plates at Dresden. It was suspended over the head of his bier as he lay dead, thus reminding us of the similar untimely fate of the great master of above, whose head, as he lay in state, was hung also in his last work, the Transfiguration. Muller left a wife and two young children.
Christian Müller engraved only eighteen plates, but the Madonna di San Sisto is in itself a host, and exhibits him at least the equal, if not the superior, of Raphael Mengs, to which the_great-novels of Mengs, of which the first volume, on Orchomenos and the Minyas, ('Orchomenus und die Minyer,' 1820), is a famous work of the first volume, on Orchomenos and the Minyas, ('Orchomenus und die Minyer,' 1820, 5vo.), it was in consequence of the advice of Heeren and a recommendation of Mommsen, that he was invited to a professorship in the university of Göttingen, with the special object that he should lecture on archaeology and antiquarian art. His activity created a new era in the history of German archaeology, and under his influence the study of philology and art criticism received an impulse, which was soon felt in all Germany, and was extended over a great part of Europe by the valuable works published by Müller in rapid succession. In order to show the extent of his knowledge of art and science, he spent in 1819 some time in Dresden, and in 1822 he visited France and England. But although his attention was more particularly directed to antiquities, he never lost sight of the fact that the arts of the ancients represented only one side of their intellectual activity, and formed only one source among the many from which a complete knowledge of antiquity is to be derived. In order to show fully the connection of religion, manners, politics, and history, in the case of one of the Greek races, Müller wrote his work on the Dorians ('Die Dörser,' 1824, 2 vols., 5vo.), which forms the second and third volumes of 'Geschichte der Helladischen Stämme und Städte,' and was translated into English by H. Tuffnell and G. C. Lewis, Oxford, 1830, 2 vols., 8vo., with various additional notes.

A new edition of the 3 vols. of the whole work has been published since Müller's death by F. W. Schneedewin, Breslau, 1844, and a new edition of the English translation of the 'Dorians' appeared in 1840. Müller intended to continue this series of works by a history of Attica, but certain scruples induced him to defer the execution of this task, and it has unfortunately never been executed. The year after the publication of the 'Dorians' Müller published his Introduction to a scientific system of Mythology ('Prolegomena zu einer wissenschaftlichen Mythologie,' Göttingen, 1825, 8vo.), of which an English translation by J. Leitch was published in London, by the British Museum, and sold at two guineas. In 1826 he published a Manual of the History of Art ('Handbuch der Archäologie der Kunst,' Breslau, 1830; a second edition appeared in 1832). This last work was the first of the kind that had been produced in Germany. The work was at once a success, and was in a short time translated into French and Italian. The work has been published in Germany under the superintendence of his brother Julius Müller. Besides these greater works Müller also wrote 'Minerva Pallasias Sacræ et Aedem in Arce Athenarum stratæ,' 8vo., Göttingen, 1830; 'De Phidias Vita et Operibus,' Göttingen, 1827, and a great number of articles in periodicals and encyclopaedic works. The only correct edition of Festus that we have is that of Müller (Leipzig, 1835, 4to.), and the critical edition of Varro's De Lingua Latina (Leipzig, 1833, 8vo.), and of the Eunomies of Aeschylus, are equally valuable.

In 1840 Müller, who had long desired to see the countries to the investigation of whose history, literature, and art his whole life had been devoted, resolved to visit Italy and Greece, partly to convince himself of the correctness of the results at which he had arrived, and partly to collect new materials. This activity in Italy was very great. He lived in July 1841, while engaged in making some excavation at Delphi, he was seized with a fever, in consequence of which he died soon after he had returned to Athens. He was buried in the Ancient Academy at Athens, the most appropriate place for a scholar like Müller that could have been devised.

Müller was a man of the most extensive and varied acquirements, and of a keen and penetrating judgment. He acquired a European reputation at a comparatively early age. His numerous works, however, are not all of equal merit, and the two faults more particularly to be noticed are his great haste in the composition of his works, and a tendency to theorise and generalize on insufficient grounds. But in extent of knowledge and reading there scarcely ever was a scholar who surpassed him.

K Michael Müller, one of the best of the English landscapers, was born at Bremen in 1758. His father was a citizen and had been instructed in painting at the school of painting at Darmstadt, and his great teacher was nature: he found an early and valuable patron in Mr. Arman, of Clifton, for whom he painted many pictures. In 1785 and 1786 he made a tour upon the Continent, to France, Italy, and Spain, and collected many admirable sketches. Sketching from nature was a department of art in which Müller had extraordinary powers; nearly all his more considerable works of this class are in themselves complete; they require no elaborated copies to make them presentable as pictures; he did indeed elaborate very few of them into pictures, and some of these rather lost than gained by the process.

In 1838 he exhibited a picture of Peasants on the banks of the Rhine waiting for the Ferry-boat, but it was a piece of no pretensions, and attracted little notice.

In 1838 he started upon a long and arduous tour through Greece and Egypt, which brought him into contact with all the monuments of the Nile, and visited the mummy-caves of our adversaries, and many other interesting places in Greece and Egypt he made masterly drawings. He returned to England towards the close of 1839, and brought with him a rich and exact description of several admirable pictures of the remarkable scenes that he had sketched during this his first oriental tour. He had in the exhibition of 1840 Athens from the Road to Marathon, and the Memnon, or Ruins of Gournou Egypt at Sunæet, both pictures of the highest degree of merit, but in different styles. The Memnon, though hung high up in the dark octagon room in the Academy, commanded the attention of every one who could see them. It is a master-piece of colour and effect, and is certainly a work of high poetic art. The view of Athens is equally excellent in its class; the pictures of the Greek temples, and the landscape connected with the place make it an additionally interesting work: this picture, for which Müller received only thirty guineas, for his works had not yet attracted a moiety of the attention which he deserved. The Emperor of Russia had to make a large picture-dealer for nearly ten times the amount. The Memnon was sold for twenty-four guineas: ten times the amount is nearer its present value also.

In 1843 Müller purchased for his own account Sir Charles Fellowes on his last expedition to Egypt, to remove to London the Xanthian marbles, now in the British Museum. He returned to London in 1844 with some dozen of very interesting ancient objects, which excited the admiration of all who saw them at a meeting of the Graphic Society shortly after his return. About three hundred sketches and other works were lately sold by auction by Messrs. Christie and Manson, and they realized the enormous sum of
A small sketch of his own apartment at Macri alone brought sixty-five guineas. These are curious facts: he himself receives only thirty guineas for his picture of Athos, a finished master-piece; he died at his study, and a few months subsequently a small water-colour sketch of his own apartment, which probably he himself would not have valued at much more than thirty pence, is sold for more than double the original price; no living artist was ever known to appear so scarcely worth the shadow of his own body when dead. The pictures, the fruits of Muller's second oriental tour, which were exhibited at the Royal Academy in 1844, appear to have been considered as of very extraordinary and unexampled beauty, and unexampled death, though the fatal results of their bad hanging on the Academy walls betray an extraordinary degree of sensibility in the public. He appears from his own letters to have had a considerable and proportionate benefit from the exhibition of these works in the Academy; far indeed however was the result from the anticipation. Muller sent the following five pictures to the Academy exhibition of last year (1845)—Great Cannon formerly belonging to the Knights Templars, Rhodes; Head of a Cingari, Xanthus; The Berial-ground, Smyrna; Tent Scene, Cingaries playing to a Turkish family, Xanthus; and Turkish Merchants with Camels crossing the river Mangerelli, in the valley of Xanthus. These works were, with one exception, what is called hung out of sight; that is, either so much below or so much above the line, that they were not easily seen, and certainly would have altogether passed over by the majority of visitors to the exhibition. Muller felt this condemnation excessively, and notwithstanding his own professed resignation to his fate, he was equally anxious for the sale of his pictures as the artists who were seized in the beginning of the month of May, which ended fatally at Bristol, on the 8th of September following. He fled from enlargement of the left ventricle of the heart; and several of his friends have not hesitated to declare that the lumping committee of 1845 killed William Muller. In his own complaint however he was more moderate; he wrote as follows to his friends in the month of May, after the opening of the Exhibition:—"A man honourably leaves his house, his family, and his possessions, and plunges into large sums of money, and, after labour and fatigue, he returns to his home, and produces pictures acknowledged to be superior to his former works. His ambition leads him not to expect too high a reward—only places where his pictures may be seen. Such had been my hope; and I find my Turkish Burial-ground and Xanthian Tent Scene on the very top,—at least the first named of the large room, conspicuously obscure. My large picture is not so badly hung (six feet or more above the ground), but in such a place that one may expect but little from it..." The second of which I have received for the expenditure of large sums, of great labour, the risk of health, and a time of complete and exhaustion of a long journey—such are the rewards, or post of honour, a protected body afforded to the young English artist! the top row of the large room. These and other extracts from letters, and the 'Art BulletinJournal,' in which are also several letters written by him while in the East, containing a short account of his proceedings, and some interesting details relating to the ruins, and the customs of the people, in Asia Minor, illustrated with several sketches. Muller exhibited several pictures at the British Institution, among which were, in 1846, A View of Rhodes with the Fasha's Palace, and a Dance at Xanthus. He exhibited also many excellent landscapes in the early part of his career at Bristol; and, besides what have been already mentioned, the following works at the Royal Academy:—In 1841, Sketch of an Egyptian Slave market; Convent, Bay of Naples; and the Sphinx: in 1843, Arabs seeking Treasure: Prayers in the Desert; and Welsh Mill on the Dolgovry. He published in 1841 the entitled 'Pictureque Sketches of the Age of Francis I.' A select series of twelve, and a few will also shortly be published.

MUN, THOMAS, is the name of an English writer on painting, who lived in the early part of the eighteenth century, but of whose person history scarcely any thing appears to be known. His best known work, a small octavo volume, published at London in 1694, is entitled 'Discourse of the Causes of Painting, and our Foreign Trade is the Rule of our Trade.' Written by Thomas Mun of London, merchant, and now published for the common good by his son John Mun of Besterad, in the county of Kent, requires. This title-page comprehends nearly all the particulars we have been able to discover respecting Mun. The book is dedicated to Thomas, Earl of Southampton, in an address in which Mun's son says:—'It was left me in the nature of a legacy by my father, for whose sake I cannot but value my all beyond the common estimation, and as such I dedicate it to your lordship. He was in his time famous amongst merchants, and well known to most men of business for his general experience in affairs, and notable insight into the nature of foreign trade; of which he wrote a book, treating of the prince, and zeal to the commonwealth. The serious discoveries of such men are commonly not unpromising.' A discourse was accordingly given, indicating the nature and extent of Mun's dealings. Having observed that Ferdinand I., the Grand Duke of Tuscany, was very rich in treasure, and enlarged his trade by lending to merchants of Tuscany goods in the same manner by which, he says, 'I myself had 40,000 crowns of him gratis for a whole year;' although he knew that I would presently send it away in specie to Turkey, to be employed in wares for his country; he being well assured that in this course of trade it would return again, according to the old saying, with a duck in the mouth. By his thus encouraging of commerce, within these thirty years the trade of his port of Leghorn is so much increased, that of a poor little town, as I told you knew it, it is now become a fair and strong city.' Ferdinand I. died, after a reign of twenty-two years, in 1609; it is strange, therefore, that Mr. Macpherson, who quotes this passage in his 'Annals of the Commercial History of Europe,' in 1800, should have not been aware that the [name] mentioned above were killed in the month of May, which ended fatally at Bristol, on the 8th of September following. He fled from enlargement of the left ventricle of the heart; and several of his friends have not hesitated to declare that the lumping committee of 1845 killed William Muller. In his own complaint however he was more moderate; he wrote as follows to his friends in the month of May, after the opening of the Exhibition:—"A man honourably leaves his house, his family, and his possessions, and plunges into large sums of money, and, after labour and fatigue, he returns to his home, and produces pictures acknowledged to be superior to his former works. His ambition leads him not to expect too high a reward—only places where his pictures may be seen. Such had been my hope; and I find my Turkish Burial-
as having been 'the Pope's scholar in the seminary at Rome.' In 1852 he was one of the instruments in the detection of the Popish conspiracy; he was a witness against some of the prisoners. His body is smoothly, and boldly colored. The Count of Tiber the 26th and 30th days of May, 1852; gathered by A. M., who was there present. He had, it appears, held a dispute at the foot of the galleries with one of the 'pussies' of Munday's first publication. His tract called 'The Mirror of Mutability' had appeared in 1797; and he published, after this date, a large number of pieces in prose and verse, original and translated, in the 'Monist,' 'Literary and Scientific Journal,' 'The Grapher' and elsewhere. His dramatic productions are now more interesting than any of the others. He is said, but on equivoque authority, to have been a player and an unsuccessful one; he was act at a small theatre in the palaces of the government, and at a small theatre in the of the corporation and companies of London. Ben Jonson, in 'The Case is Altered,' written early in 1599, ridicules him and his city-shows, in his character of Antonio Badalino, making this personage to say of himself, that he supplies the place of peasant-poet to the city of Milan when a worse cannot be had, and that he uses as much state stuff as any man does. Perhaps Ben's critical acumen was a little sharpened by the fact that Munday had just been called 'our best poet' in 'Meres' 'Paladins Tamia,' in which Jonson's own name is not mentioned. Mr. Collier enumerates fourteen plays which Munday wrote, and then adds, writing, desiring to be added to this list the recently discovered, and called 'The Two Italian Gentlemen,' which he attributes to Munday, and infers to have been acted about 1584. The following other plays of Munday are mentioned, viz.: 'The Death of Earl of Huntingdon,' by Anthony Munday; 'The Death of Robert Earl of Huntingdon,' by Anthony Munday and Henry Chettle, both acted in February, 1598, and printed in 1601. Both are reprinted in Mr. Collier's 'Supplementary Volume to Dodge's Old Plays.' They are rude and irregular pieces, possessing much vigour of painting, and presenting, in the scenes with Robin Hood's band in Sherwood Forest, some pleasing poetry. It, 'The Death of Charm,' acted in July, 1609; and supposed to be the comedy of 'The Puritan, or the Widow of Watling Street,' which was printed in 1607, and has been absurdly attributed to Shakspeare. 4. 'The First Part of the Life of Sir John Oldcastle,' by Anthony Munday, Michael Drayton, Robert Wilson, and Richard Hathaway; published twice in 1601, one of the editions attributing it to Shakspeare. Munday died on the 10th of August, 1635, and was buried in the church of St. Stephen, Coleman-street.

MURAT. CAROLINA MARIA ANNUNZIATA BONAPARTE, sister of Napoleon, born at Ajaccio, in 1781, married in 1802 General Murat, then aide-de-camp to the Emperor Napoleon, and took the name of Bona Parte, afterwards Queen of Naples in 1808. She was the only sister of Napoleon who became a queen. She took a considerable part in the public affairs of the kingdom of Naples, and was frequently at court, and was often called upon to oblige to follow Napoleon in his never-ending wars. She displayed much ability, prudence, and firmness; she encouraged education and learning, and founded several useful institutions, among others one for the education of young ladies at Naples, which still remains. She had at various times a difficult task in acting as the part of a conciliator between her spirited but imprudent husband and her imperious brother. After seven years of reign, during which she showed herself worthy of the crown, she was obliged, through the reverses of her husband in 1815, to leave Naples on board of an English man-of-war, and to retire to Austria, where she lived for many years, and there died (March 21, 1824) in the house of the Count Cepli of Bologna. Madame Murat made a journey to Paris after 1830 for some family interests, and was well received by Louis-Philippe and his family. She afterwards went to Rome, and died there (November 15, 1854). Murat had a very favourable opinion of his sister Caroline.

(Lieu, Annivée.)

MURENA, an apodous sculp-tured fish of the family Muridae, and one of the large class of bony fishes. It is of the genus Helix. The operculum is large and oblong, one in each side. In each jaw there is a single row of teeth. The dorsal and anal fins are very long, and are united. The Murena Helena is one of the genus. It is found in the Mediterranean and Portuguese seas, and in one instance has been taken on the coasts of Britain. It grows to the length of between four and five feet, and even more. The body is smoothly, and boldly colored. The head is large and swollen, giving the fish a disagreeable aspect. It is excellent eating, and is highly esteemed by the ancients, who reckoned it among the best of fishes for the table, and kept the Murenae alive in vivaria.

MURPHY, ROBERT. No obituary has yet appeared, as far as we know, of this distinguished mathematician: and this, while we wish to remain with the interesting facts, and the talent alone, may justify us in giving the facts we have been able to collect at length. The materials for his early life have been communicated by J. Dillon Croker, Esq., of Mallow, one of his first pupils, and as the sheets for the pages of the corporation and companies of London. Ben Jonson, in 'The Case is Altered,' written early in 1599, ridicules him and his city-shows, in his character of Antonio Badalino, making this personage to say of himself, that he supplies the place of peasant-poet to the city of Milan when a worse cannot be had, and that he uses as much state stuff as any man does. Perhaps Ben's critical acumen was a little sharpened by the fact that Munday had just been called 'our best poet' in 'Meres' 'Paladins Tamia,' in which Jonson's own name is not mentioned. Mr. Collier enumerates fourteen plays which Munday wrote, and then adds, writing, desiring to be added to this list the recently discovered, and called 'The Two Italian Gentlemen,' which he attributes to Munday, and infers to have been acted about 1584. The following other plays of Munday are mentioned, viz.: 'The Death of Earl of Huntingdon,' by Anthony Munday; 'The Death of Robert Earl of Huntingdon,' by Anthony Munday and Henry Chettle, both acted in February, 1598, and printed in 1601. Both are reprinted in Mr. Collier's 'Supplementary Volume to Dodge's Old Plays.' They are rude and irregular pieces, possessing much vigour of painting, and presenting, in the scenes with Robin Hood's band in Sherwood Forest, some pleasing poetry. It, 'The Death of Charm,' acted in July, 1609; and supposed to be the comedy of 'The Puritan, or the Widow of Watling Street,' which was printed in 1607, and has been absurdly attributed to Shakspeare. 4. 'The First Part of the Life of Sir John Oldcastle,' by Anthony Munday, Michael Drayton, Robert Wilson, and Richard Hathaway; published twice in 1601, one of the editions attributing it to Shakspeare. Munday died on the 10th of August, 1635, and was buried in the church of St. Stephen, Coleman-street.

Robert Murphy was the third of the seven children of a shoemaker, parish clerk of Mallow in Ireland: he was born in 1606. His father intended to have brought him up to his own trade; but the son's destination was changed by an accident which nearly cost him his life. When eleven years of age, while playing in the streets of his native town, he was run over by a cart, and lay on his bed for twelve months with a fractured thigh-bone. From confinement, his family supplied him with such books and newspapers as they could procure; and among them there happened to be a Cork almanac, containing mathematical problems. These attracted the child's attention, and made him possessing Euclid and a work on algebra. The books were procured with some difficulty, and before he was again able to walk, and before he was twelve years of age, young Murphy was an extraordinary instance of a self-taught mathematician. A gentleman of the name of Mulcahy, of Cork, who was the tutor of most of those from the south of Ireland who got fellowships at Dublin Colleges, was in the habit of proposing problems (or cuts, as they are called in Cork) in the newspapers. At a certain time, he began to receive answers by return of post, from Mallow, without any signature. Surprised at the extraordinary talent displayed in these answers, Mr. Mulcahy went to Mallow to find out his unknown correspondent. After some difficulty, he found that the asserted author of the answers was a boy on crutches, so young that he could not believe the story. A few minutes' conversation, however, put it beyond a doubt. On coming away, in amazement, he happened to meet the gentleman to whom we are indebted for this account, to whom he said, with natural exasperation, 'Mr. Croker, you had a duplication of the cube, and it was done in Mallow: pray look after him.' It was then agreed that the boy should give up learning his father's trade, and pursue his studies. Mr. Hopely, who kept a classical school in Mallow, had the boy taken by him, took no charge of any kind; and he, in after life, had the satisfaction of transmitting to the widow of his teacher, then reduced to poverty, the sum which an ordinary pupil would have paid. When he attained the age of twenty, a certain amount of money was made to get him entered as a student of Trinity College, Dublin, but without success. The examinations for scholarships being classical, he had no chance: and some mathematical papers—which were sent to the authorities as the productions of a boy who had never had a teacher, and which, to judge by what we shall presently see, must have been of no common merit—received no attention. At this time Mr. Mackey, a Roman Catholic priest, published a duplication of the cube, the plausibility of which attracted attention, and, it is said, even obtained the assent of the teachers at Maynooth. Young Murphy, then eighteen years of age, answered this duplication in a pamphlet, entitled 'Refutation of the Claims of Father Mackey': the Rev. John Mackey, R. C. P. entitled 'A method of making a cube double of a cube, founded on the principle of elementary geometry,' wherein his principles are proved erroneous, and the solution not yet obtained; by Robert Murphy, Mallow, 1824' (20 pp.). The manner and style of this production are really extraordinary under the circumstances: with the exception of a little too much accuracy of expression, and a slight irregularity of style—nothing, which a critic would not find anything to attack in it, even as the work of an educated person of mature age. The young author had a confession in his style between Lord Brummaker and Dr. Brinkley, when he said: 'Dr. Brinkley told me, if he had seen it, he would have thought the circumference of a circle by a continued fraction.

The gentleman to whom we have several times referred now determined to try to get young Murphy sent to Cambridge. He applied to the clergyman of the boy

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with his Euclid and algebra. Mr. Brown, who was then em-
ployed in a bank of which Mr. McCarthy, a Cambridge
Master of Arts, was the proprietor. This last-named gentle-
man, being then about to visit England, promised to take
some of Murphy's papers with him, and to do what he could to
interest him in himself. (Professor Wilson, F. R. S.,
Vic., P. C.), to interest himself in the matter. The first answer
was not very encouraging. Mr. Woodhouse would say no
more than that if they would send the boy he would look
after him. On being requested to look over the papers,
he declined, saying, that he had no time, and made it a
rule not to do so. He desired that the papers might be
taken away, and on being requested to allow them to re-
maintain possession of their papers, he said that he was
able to deal with them, he predicted for them the fate of waste paper, and
the interview ended. In six weeks from that time, however,
Mr. Woodhouse wrote a hurried letter to Mr. McCarthy,
stating that at the moment when he was about to tear the
papers, in fulfilment of his prophecy, his attention was struck
by something that was almost new to him—that on turning
page after page, he saw with delight so much talent that he
was really unable to say how long he remained fixed to the
subject that he intended should occupy him but a moment—
that suddenly, recollecting it was the last day for entrance, he
hastily went and placed the name of the writer on the boards of
G. and G. he concluded by saying that Mr. Brown's friends would send him with fifty or sixty pounds in his pocket,
it would take care that they should not be called on again:
and this promise was faithfully kept. Mr. Croker immedi-
ately paid [....] pounds on Murphy's behalf, and Mr. Murphy began his residence at Caius College, in October, 1825. During his residence, the college supplied him with
money, in addition to the proceeds of his scholarship. In 1829
he took the degree of bachelor of arts, and came out third
 wrangler. The highest place is sometimes not to be gained by
any amount of genius and industry, unaccompanied by strict at-
tention to the University course of reading; and Mr. Murphy's
time was much occupied by a variety of studies, which did not
would not turn much account in an examination. In May,
1829, he was elected fellow of Caius; he shortly afterwards
took deacon's orders (he did not proceed farther), and was
made deacon of G. In the same year, he was made an actor
who, under the master, regulates the chapel discipline) in
October, 1831.
Of what he did in mathematics we shall presently speak;
we could wish there were nothing more to say of his private
life. He gradually fell into dissipated habits, and in December,
1832, left Cambridge, with his fellowship under sequestra-
tion for the benefit of his creditors. There is much excuse
for this. He was brought up in a very active and pushy
force of early talent into a situation in which ample com-
mand of money is accompanied by even more than proportion-
ate exposure to temptation. His college admitted the excuse to
life, and though it tolerated his prolonged residence of an officer who had shown such an example,
yet it was understood that his ultimate promotion to one of the more valuable fellowships would take place, on the amendment of his life. This college (G. in the same
year) in London, he came to London in 1836, to begin life again as a
teacher and writer. Among other things, he obtained from the
Useful Knowledge Society an engagement to write the
work on the Theory of Equations presently mentioned. In
October, 1838, he obtained a small permanent income by his
appointment to the examination in Mathematics and Natural Phil-
osophy in the University of London; but burdened as he was
with debts, this was only an addition to the instalments of his
credits, to an increase of his own means of comfort. He
submitted with resignation to the effects of his own miscon-
duct, and showed himself most willing to make every exertion,
though well knowing that many years must elapse before he
could, by any effort, redeem the ground he had lost. He
died March 12, 1848, of a disease of the lungs.
Mr. Murphy's writings were as follows:— Cambridge Phil-
osophical Transactions; vol. iii., part 3, General Properties
of Definite Integrals; vol. iv., part 1, On the Resolution of Al-
gebraic Equations; part 3, On the Inverse Method of Definite
Integrals, with Physical Applications; vol. v., part 1, On Elimi-
nation of Variables in Algebraic Equations of the Fourth
and Fifth Degrees; part 2, second memoir on the Inverse Method of Definite
Integrals; part 3, third memoir on the same; vol. vi., part 1,
On the Resolution of Equations in Finite Differences. Phi-
losophical Transactions; vol. i., part 1, Analysis of Algebraic
Equations; part 2, First Memoir on the Theory of Analytical
Operations. Separate works:—Elementary Principles of the
Theory of Equations; 8vo.; A Treatise on the Theory of
Algebraic Equations, London, 1833, 8vo.; On Electricity, Cambridge, 1833, 8vo.; (Library of Useful Knowledge): to these must be added some brief
articles on subjects of physics in the Penny Cyclopaedia,
beginning with the letter D.
Mr. Murphy's character as a mathematician is too well
known to require any comment of ours; while the facts of his
life, and in particular those of his removal to Cambridge, have
not been recorded: we have therefore preferred to devote our
space to the insertion of the latter. What he might have
been if the promise of his talents had not been dashed by the
unfortunate circumstances we have described, it is difficult
to say: for he had a true genius for mathematical invention.
Before however he had more than commenced his career, his
departure from Cambridge, and the necessity of struggling for
a livelihood, made it impossible for him to give his undivided
attention to researches which, above all others, demand both
peace of mind and undisturbed leisure.
MURRAY, LINDLEY, was born in 1745, at Swetara,
near Lancaster, in the state of Pennsylvania, North America.
His parents belonged to the Society of Friends, and he was
the eldest of twelve children. He received the rudiments of
education in the family besides the religious instruction in the
Society of Friends. In 1758, his father, who was an enterprising
merchant, removed with his family to New York, where Lindley
was sent to a good school. At an early age he was placed in
his father's business. After the latter's death, in 1767, the young
merchant profession, but having taken a decided dislike to it,
he prevailed on his father to allow him to have a private tutor
to instruct him in classical learning, and afterwards to place
him under an eminent lawyer, in order to receive instruction
in the law, to which profession he had resolved to devote him-
self. John Jay, afterwards governor of the state of New
York, was his fellow-student. About the age of twenty-one
he was called to the bar, and obtained a good practice he
soon afterwards married. He was sedulous in his applica-
tion to his business as a lawyer, and very successful till the
disputes commenced between Great Britain and America.
The law then ceased to be lucrative, and he entered into the
mercantile profession, with such success that about the time
of the establishment of American independence he had acquired
sufficient property to allow him to gratify his wish of retiring
from business.
Lindley Murray purchased a beautiful seat on the banks of
the river about three miles from New York, but before he
removed to it he had a severe attack of illness, which left him
in a very delicate state of body; the tone of his muscles
were so much impaired that he could walk but little, and his
debility continued to increase, in spite of change of scene,
bathing, and every other means of remedy to which he had
been subjected. In 1816, he removed to the country near
Davison, in New York, where he resided during the remainder of his
life. For a short time his muscular strength increased,
but afterwards diminished till he could no longer take exer-
cise except in a carriage, or in a vehicle in which he was
drawn about his garden, but for many years before his death
he was entirely confined to his room. In the sedentary state
to which he was reduced he occupied himself by reading and
the composition of works chiefly intended for the instruction of
youth.
Lindley Murray's first work, 'The Power of Religion on
the Mind,' was published anonymously in 1787. It is a
selection of passages from various authors, and was very
favourably received. The first edition of his 'English Gram-
mar' was brought out in 1796. A second edition was soon
required, and the book was revised and enlarged by the au-
thor, and then reprinted. 'Exercises,' to correspond with
the Grammar, and a 'Key' to the Exercises, were published
in 1797, in which year he also published an Abridgment of
the Grammar for the use of minor schools and those beginning
the study of the language. The work had a great sale
between him and each other; and were soon introduced into many schools.
The sale of them has been very large, and still continues
to be so. Murray's Grammar and Exercises however are
entitled to the highest praise; and he has been the last of the Rotten,
from which the materials have been arranged; they do not even approximate
The closest alliance of business and friendship long subsisted between Mr. Murray, and Constable of Edinburgh, and the Ballantynes; but he early perceived the result of the reckless mode of life which he conducted, and in foregoing the great advantages of the connection, after repeated and strong warnings and remonstrances, he separated from them. He published, however, 'The Tales of My Landlord,' and had no difficulty in discovering the real author of 'Waverley,' nor did he ever entertain any doubts on the subject.

In 1810 he sought and made the acquaintance of Lord Byron, giving 'Waverley' to the editor of 'Galignani's Harold,' which had been refused by another publisher. In 1812 he removed to Albermarle Street, where, increasing the number of his friends and literary connections, he soon surrounded himself with a circle of literary characters. In the afternoon might be found in his drawing-room, Scott, Byron, Campbell, W. Spencer, R. Heber, Gifford, D'Israeli, Mr. Ward (Lord Duddly), Canning, Hallam, Croker, Barrow, Madame de Staél, and, a few years later, Crabbe, Southey, Belzoni, Washington Irving, Lockhart, and many more.

His acquaintance with Byron extended over a period of more than ten years, and the poet's correspondence with him is printed in Moore's Life of Byron, where will be found more than one proof of his liberal mind. Having heard in 1815 that Lord Byron was in pecuniary difficulties, he sent him a draft for 1000 guineas. It was received at the course of a few months, and offering to sell the copyright of Byron's works for his use, if that were not sufficient. He abandoned the publication of Lord Byron's Autobiography, at a considerable profit, he being it was said, persuaded that it of it might hurt the feelings of the living, and do not credit to the dead. The MS. and the only existing copy of it were consequently committed to the flames in 1824. Soon after Mr. Murray commenced printing a series of 'Modern Voyages,' parts, consisting of 'Modern Voyages,' the publication of which was delayed by circumstances—a specimen however given by him to Captain Basil Hall was taken to Edinburgh, and suggestions suggested the possibility of being printed in the 'Scotsman.' In 1826, trusting to others more sanguine than himself, and allowing his own good judgment, perhaps, to be misled by partiality for the projector, he commenced 'The Representative,' a daily newspaper—almost the sole undertaking of his life which proved a failure. It was attended with considerable loss, which fell entirely on him, and was soon given up. Among his valuable and successful publications were the expeditions of Munro Park, Belzoni, Perry, Franklin, Denham, and Clapperton—the Family Library, begun April, 1829—the Domestic Cookery, of which nearly 300,000 copies have been sold, the fortunate title having been suggested by the 'Ladies' Manual.'

Further part of his life was passed as a general bookbinder, in partnership with Mr. Highley, but having dissolved the partnership in 1850, he soon devoted his attention to a wider field of literary business. The son of an old friend and neighbour, Dr. Bennell, Master of the Temple, Mr. Stratford Canning, with some other youths at Eton, had commenced a periodical called 'The Miniature,' which brought them some fame, but left them under loss. Mr. Murray, with a good nature which always distinguished him, and with something of that tact which enabled him, in his subsequent career, to seize upon occasions of cultivating powerful friends, on hearing of their situation took the copies off their hands, paid their expenses, and though he found little demand for the work, offered to print a new edition. Through the friends thus made, he became known to Mr. Canning. In September, 1807, he wrote to that gentleman opening to him the plan of the 'Quarterly Review,' as a means of counteracting the political influence of the 'Edinburgh Review.'

While maturing his project—the most important undertaking of his life—it chanced that a severe criticism of Scott's 'Marion' (1820) appeared in the 'Edinburgh Review.' Mr. Murray instantly started for Scotland, was introduced to Scott at Ashieethe, in September, 1828, found in him a warm supporter of his intended review, and subsequently the idle speculations of Mr. Murray. Hebers, George Ellis, Canning, Barrow, and Mr. Gifford, the editor, the publication commenced in 1809, and soon attained a circulation of 12,000 copies.
effort by dealing honourably and generously with authors whose reputation was established, or of whose success there could be no doubt, was not as unfortunate as the equitable distribution of the rewards of the capitalist and the labourer. He was distinguished too, by his careful avoidance of the low arts of puffing; he published, for the most part, books of worth, and his impartial alone gave a recommendation to a science which raised it above the necessity of advertising quackery. Mr. Murray continued to take an active share in his business until within a short time of his death. Although his health had been in precarious state for some months preceding it, no danger was apprehended until two or three days before this occurred. Mr. Murray married in 1807 the daughter of Charles Eliot, bookseller, of Edinburgh, by whom he left one son, who continues his business, and three daughters.

MUSCA, a genus founded by Linnaeus for the reception of the Dipterous insects, commonly known as Flies. The Linnaean genus has been broken up by subsequent entomologists into many genera and even families. Of the typically Muscidae no fewer than 1700 European species have been described by Meigen, and nearly as many more extra-European have been described by Robineau Desvouz in a quarto volume of 912 pages, devoted entirely to this subject.

Many of the Muscidae are interesting on account of their habits. Some of the species of Myobia deposit their eggs in the nests of Hymenoptera, so that their larvae when hatched are placed in the middle of the nest where they feed on the larvae of the Hymenoptera. The larvae of Tachina are parasitic on other larvae. Those of some other genera are only found in the dead bodies of particular species of animals, as Cynomya, which resides in the cavity of the brain of wild-boars, and blow-flies of species of Lucilia and Calliphora, lay their eggs in meat, which becomes fly-bitten. Anthomyia deposits its eggs in manure or in the roots of vegetables, and Tephritis in growing plants. The adult male of the larva of this family named Piophila casei. Dryophila collaris deposits its eggs in fermented liquors.

Most of these flies are extremely prolific; the ovaries of the female, according to Megas, contain eggs that have been found to be arranged in spiral fashion and to contain as many as 20,000 eggs.

(Westwood, Introduction to the modern Classification of Insects and the writings of Meigen, Haliday, Desvouz, and Macquart.)

MUSCA/R/1, a genus of plants belonging to the natural order Liliaceae. It has a globose or subglobose perianth narrowed at the mouth and 6-toothed. The stamens are inserted at about the middle of the tube, the filaments not recurved. R. racemosus, Grape Hyacinth, is the only British species of the genus; it is found in Scotland near Perth, and is found in some other parts of Great Britain. It has ovate nodding crowded flowers, the upper ones nearly sessile, abortive; the leaves linear, falcate, and recurved. The flowers are often heard in the garden at this time of year. The bulbs of Muscari are, according to Lindley, emetic.

(Bulbring, Manual of British Botany; Lindley, Vegetable Kingdom.)

MUSCOVADO SUGAR. [SUGAR, P.C.]

MUSCULAR TISSUE. [TISSUES, ANIMAL, P.C.S.]

MUSEUM OF ECONOMIC GEOLOGY. This institution owes its origin to the suggestions of Sir H. T. De la Beche, who, in 1835 submitted to the Chancellor of the Exchequer, that the persons employed in the Ordnance Geological Survey had constant opportunities afforded them of collecting specimens illustrative of the application of geology to the useful purposes of life, and of the mineral wealth of the kingdom. The advantages which would arise from such a collection, and its exhibition to the public, under the care of the Board of Public Works, were briefly pointed out. The Museum now occupies the houses Nos. 5 and 6, Craig's Court, Charing-Cross, the former containing the Mining Record Office; and the latter the specimens; the establishment is open to the public, between the hours of ten in the morning and four in summer, and ten and five in winter. The principal officers to the establishment are Sir H. T. De la Beche, already named as the Director, Mr. Richard Phillips, Curator, who is also the Librarian of the Museum; Wm. Voda Dr. Lloyd; Playfair; Mr. Robert Hunt is keeper of the Mining Records.

The objects contemplated in the arrangements which have been effected were—to obtain specimens of the various mineral substances used for the construction of public works or buildings, or for road-making; of such as are employed for useful or ornamental purposes in the arts, or from which the useful or ornamental products being arranged with reference to the instructions of those to whom such knowledge would be advantageous, either in a scientific or practical point of view.

With respect to building-stones it may be observed in illustration of the utility of the establishment, that there exists in it a collection, described by appended tickets, of the various specimens of building-stone, procured by the Commissioners appointed in 1836 to visit the quarries and to ascertain the qualities of the stone to be used in building the New House of Parliament. These specimens, with the elaborate report in which their properties are described, cannot fail to be a source of great and lasting utility to the architect who seeks for information.

In addition to these specimens there are also exhibited numerous polished granites, porphyries, and marbles from various parts of the kingdom; some of the specimens are turned into columns, and others turned and vases.

Another object intended to be effected by the formation of the Museum is the promotion of improvements in agriculture, by exhibiting specimens of strata, with specimens of soil, subsoils, and the rocks from the decomposition or disintegration of which they have been produced. It is intended, by this department of the Museum particularly, to exhibit the relations of geology to agriculture by imparting such a knowledge of the mineral riches of any extensive tract of country, that the Director has been especially careful in collecting specimens of the coal from every part of the British kingdom, and the public have liberally contributed to this and indeed to every part of the institution.

An annual grant is voted by Parliament for geological sections of railway cuttings, a service of much importance, especially in the mineral districts.

The Museum contains an extensive collection of the various metalliferous ores of Great Britain, with specimens of the results of the metallurgical processes by which the metal is extracted, accompanied with illustrations of many of the purposes to which the metals are applied.

The application of various earths and metallic oxides to enamelling, and the manufacture of glass and of porcelain, is illustrated by specimens of the art of different ages.

It is to be further observed that a laboratory forms another department of the Museum, in which the application of minerals is performed for the public on very moderate terms, and pupils are admitted into the laboratory for instruction in analytical and metallurgical chemistry.

In the museum of the present department are deposited plans and sections, and models of mines, and of the machinery by which they are worked; it also contains workshops in which many of the models have been constructed; and collections of mining tools and instruments are now in daily use.

The department having for its objects matters which concern particular parties, rather than the public generally, is, from the nature of its contents, not open to indiscriminate admission, but every reasonable facility is afforded to all operative miners as well as the owners or agents of mineral properties, by application to Mr. R. Hunt.

In concluding this brief sketch of the Museum, we may observe that, owing to the great liberality with which it has been supported by the government and by the public, it has been for some time past impossible to exhibit the accumulated specimens for want of room. It is understood that, on this account, Government is building a large and more commodious house for the purpose, which will extend from Piccadilly through to Jermyn-street.

MUSKROOM. [Agaricus, P.C.]

MUSKA, a genus of fossil plants, the fruits only known. From the coal measures of Lancashire. (Bronnmlart.)

MUSCOWA, or MASSOWA. [Anthemia, P.C.S., p. 24.]

MUTILLIDÆ, a family of Hymenopterous insects corresponding to the Linnaean genus Mutilla. These bees belong to Latreille's family Apidae; all of the species are remarkable for the power of their stings.

MUZIA'NO, GIROLAMO, an eminent Italian painter, was born at Acquafreda near Brescia, in 1528. He was first instructed by G. Romanino at Brescia; he then turned his
attention to the colouring of Titian, and particularly to his landscape backgrounds. About 1550 he went to Rome, where he first attracted notice as a landscape-painter, and he was known as 'the great landscape painter' by the Italian critics. He was known as ‘the landscape Jerome.’ He however soon showed that he was equally capable not only in all departments of painting, but in other kindred arts likewise; and he became one of the first painters of his time, and even in the characteristic grand style of the Roman school he obtained a place in the ranks of the greatest masters. Michelangelo himself pronounced Muziano to be one of the first painters of the age, when he saw his large picture of the Assumption of the Virgin, which he painted for the church of Santa Maria Maggiore. This picture was afterwards removed to the Armeno de’ Principi in the Quirinal, or papal palace of Monte Cavallo, where it was preserved, although destroyed, in 1768, but it was not seen there by Ramondi a few years afterwards. There was a Resurrection of Lazarus by Muziano in the Orleans Gallery at Paris, but as this piece was engraved by S. Vallois for the ‘Cabinet de Crozat,’ in 1729, as a part of the Orleans collection, it cannot be the picture so much approved of by Michelangelo, unless the account of Titii is incorrect. When the part of the Orleans collection, of which it was one, was sold by auction in London in 1806, it fetched only fifty-six guineas: who the purchaser was, or where it is now, is not publicly known.

There are many of Muziano’s works in the private collections and palaces of Italy, and his works are to be found in the various churches and the cathedrals of Orio and Foligno, in the church of the Madonna at Loreto. There is likewise a very celebrated picture by him of Christ washing the feet of his disciples, in a church in the same city, which has been engraved by L. Deplasni. Muziano painted many historical landscapes, or landscapes with historical personages or events so introduced into them as to be secondary objects, and of which scenes he was the occasion for a title to the landscape. Several of these pictures have been engraved by C. Cort, who executed also some prints after other works by Muziano.

The Roman mosaics-executed in this style. He performed great services in the art of working in mosaic: what was merely a crude and ornamental art of inlaying coloured stones, he brought almost to the perfection of painting. As an architect, he built the Capella Gregoriana, or the chapel of Gregory XIII. in St. Peter’s, in which are two of his best pictures, which however he did not live to complete; they were finished by his most distinguished scholar Cosme Nebbia, a painter of Orio. Muziano also completed the series of drawings which Giulio Romano had commenced from the sculptures of the Colonna Trajana at Rome, and the first plates of which were engraved from these grounds, or the prints of Bartoli were engraved from drawings by himself. The foundation of the Academy of St. Luke at Rome is also due chiefly to the exertions of Muziano: he procured the building for it, and it is now open to Gregory XIII., and it was confirmed by Sixtus V.

Muziano died at Rome in 1590, according to Baglione (Ridolfi says 1592), and was buried in the church of Santa Maria Maggiore, near the spot where his picture of the Resurrection of Lazarus was placed. His style was severe, and more than ordinarily correct for his time, though he may be reckoned among the imitators of Michelangelo, whose anatomical display seems to have had its due share of influence, on the taste of Muziano. Many of Muziano’s works have been engraved by some of the best engravers of the seventeenth and eighteenth centuries, and by his contemporaries, Ch. Albani and C. A. Ascani.

(Muguale, a species of spiders, the species of which have their eyes placed closely together at the anterior extremity of the thorax. They spin their webs in the form of tubes, in which they are concealed. They travel under stones, or the bark of trees. In consequence of the representations of Madame Merian, some kinds of Mygale have become celebrated as butterflies; and even spiders! Mr. St. Helier has however shown that Madame Merian’s drawing is not to be trusted, since the Mygale there figured is a supernumerary spider, and makes no net in which to entrap small birds. The same distinguished naturalist has observed a spider belonging to the genus Epeira: eating a young bird of the genus Zosterops, which had been entangled in its net in a garden in Sydney, New Holland. In a communication of Mr. Macleay to the Philosophical Transactions in 1822, he says, History for 1842, he remarks on the subject of bird-catching spiders as follows:—‘My conviction is that Madame Merian has told a wilful falsehood respecting Mygale, or rather has painted a falsehood respecting Lycophora, which I have proved to the genus Nephila, which lives in a geometrical net, does not catch birds either here or in the West Indies; and moreover, I have ascertained that birds are not the proper food of this New Holland spider.’ The Mygale Iodice, a Grecian species, forms a very ingenious trap-door with which to close up the mouth of its tube. MYOSUROS (from μυς, a mouse, and σως, a tail, the seeds being seated on a long receptacle ‘which looks exactly like the tail of a mouse’), a genus of plants belonging to the natural order Ranunculaceae. It has a calyx of 5 sepals, prolonged into a spine at the base; the petals 5, with a filiform tubular claw; the ovary deeply imbricated upon a very long receptacle, numerous carpels, and linear leaves. It grows in damp places in fields. It is a native of Europe and America. The American plant has been described as M. S. Smith, but I doubt whether I should believe it is the same as the British and other European plants.

(Begonia, Monon.)

MYOSTOBitus (from μυς, a mouse, and ὀνος, the erume form of ος, an ear), is a genus of plants belonging to the natural order Boraginaceae. It has a 5-parted calyx, the corolla salver-shaped, contorted in stivation; the throat closed with scales, the limb 5-fid, obtuse; the stamens included, with filaments very short; the style and the nectary, externally con- vex, keeled within, attached by a minute lateral spot near their base. This genus is distinguished from all the other Boragi- neae genera, by the possession of a contorted stivation of the corolla. The species are annual or perennial, rough or smoothish plants, with blue flowers in terminal racemes, which are revolute before expansion. About fifty species have been described, which inhabit the more temperate parts of Asia, Africa, and America, and are found abundant in Europe. Eight species are found in Great Britain.

M. palustris, Great Water Scorpion-Grass, or Forget-me-Not, has the calyx open when in fruit, and shorter than the perianth, the calyx-lobes divided, with strigose-bristled, con- cava, the limb of the corolla flat, longer than the tube, the lobes slightly emarginate, the subgenus of the stem spreading. It is a native throughout Europe, and also of Asia and North America. In Great Britain it is found in wet meadows, bogs, banks of rivers, rivulets, and ditches. This plant has a large bright blue corolla with a yellow eye. It is a beautiful plant, and when once seen will be seldom forgotten. It is probably on this account that it has obtained its common name Forget-me-Not. Amongst the young it is regarded as emblematical of true affection. A variety is described with white flowers.

The following are the remaining British species of this genus:—

M. repensa, Mouse Ear, with narrow lanceolate teeth; lobes of the corolla slightly emarginate, the subgenus of the stem spreading. Found in dry places.

M. coerulea, with narrow lanceolate teeth; the limb of the corolla equaling the tube, the lobes entire, the subgenus of the stem adpressed. Found in water places.

M. scorpioides has an attenuate limb of the corolla longer than the tube, the root-leaves on long stalks pointed. Only found in Scotland on the summits of the Breidablik mountains.

M. alyssoides has a calyx rounded below, deeply 5-cleft, closed when in fruit; the limb of the corolla longer than the tube, flat; the root-leaves blurnish. Found in shady places.

M. alyssoides, with the calyx-lobes of calyx, has the calyx half 5- cleft; the limb of the corolla longer than the tube, concave. Grows in cultivated land and thickets.

M. collina has the calyx open and ventricose when in fruit. Found on dry bank.
M. varicolor has the calyx closed and oblong when in fruit. It has small flowers, at first pale yellow, afterwards red. It is found in meadows and on banks.

None of the British genera is the size of the myrtles or the arts. The British species are most desirable for cultivation, especially M. palustris and repens. All the perennial species require moist situations, as the edges of ponds or ditches. Some of the species may be grown in pots among other alpine plants. The annual species will grow in a dry sandy soil or on old walls, where the seeds may be sown. The other species may be propagated by dividing the roots.

(Myrtaceae; Manual of British Flora; Don, Gardener's Dictionary.)

MYRICA, a genus of fossil fishes, from the beds of Domanian (Agassiz). MYRANTHES, a genus of fossil Annelsida, from the lower silurian strata of Lamberth, in South Wales. (Murchison.)

MYRIA (the Greek unnamed), a genus of plants the type of the natural order Myricaceae. It has its flowers in catkins, which are composed of concave scales; 4 to 8 stamens. The fruit a 1-celled 1-seeded drupe, and no perianth. There are several species of this genus, which are shrubs or small trees.

One species, M. Gale, the sweet Gale or Box Myrtle, is a native of Great Britain. It has lanceolate serrate leaves broader upwards, with a shaggy stem. It is a bushy plant, and the catkins are sessile and erect; the fruit is covered with red or yellow glands, and the leaves are fragrant when bruised. This plant is found on the Continent of Europe, and also in North America, under the same circumstances. The leaves are divided into catkins, leaving a yellow stellate oil, of a fleshy odour, and mild taste, which after a little time becomes slightly warm. The seeds were formerly used as a remedy against the itch, and when bruised are used amongst fires for the destruction of the moth. In decoction they are employed for the destruction of bugs and other vermin. In Sweden they are used as a substitute for hops in brewing.

Wax-myrtle or Bay-tree, has cuneate lanceolate leaves, sometimes entire, but more frequently toothed, particularly toward the end, somewhat pubescent, a little paler beneath, and generally twisted or revolute in their mode of growth; has a branching half evergreen stem, from one to twelve feet high. The small flower is formed by a concave rhomboidal scale, containing 3 or 4 pairs of roundish anthers, on a branched footstalk. The pistilliferous catkins which grow on a different shrub are less than half the size of the staminiferous ones, and consist of narrower scales, with each an ovate ovary, and two filiform styles. To these catkins succeed clusters or aggregations of small globular fruits, which are at first green, but finally become white or yellow. They are covered with a hard sheathing covering, which incloses a dicotyledonous seed. The hard covering is studded on its outside with small black grains, and over these is a coating of hard white wax, fitted to the grains, and the whole sheathing covering of the fruit of the wax-myrtle. This plant is a native of woods in the United States of America. The bark of the root of this plant is acid and astringent; in large doses it produces vomiting, accompanied by a burning sensation in the throat. It is used as a stimulant and astringent. The wax of the fruit is collected and purified, and used for many of the purposes for which bees-wax and candles are employed. The wax has been occasionally used in pharmacy in the same way as common bees-wax.

The fruit of M. sappida, a native of Nepal, is about the size of a cherry, and is pleasantly acid and eatable.

(Lindley, Flora Medicia; Lindley, Vegetable Kingdom; Babington, Manual of British Flora.)

MYRIOPHYLLETS, a genus of fossil plants, from the coal measures. (Arnis.)

MYRIOPHYLLUM (from myro, numerous, and phyllon, a leaf), a genus of plants belonging to the natural order Halaeraceae. It has monoeccious flowers; a 4-parted calyx; 4 petals fugitive, longer than the calyx in the staminiferous flowers, small and reflex, or none in the pistilliferous flowers; style a little style, villous and separable into 4 hard nuts. The species are floating aquatic herbs, rising above the water to blossom. The leaves are finely cut opposite or verticillate; the flowers are small, disposed in spikes or in whorled spikes, the upper leaves being almost abortive. M. verticillatum, verticillate water milfoil, has the flowers all axillary whorled, the bracts pinnatifid. It is a native of Europe, in ponds, ditches, pools, and lakes, but never in running water. It is found in Great Britain, but is a rare plant, M. spicatum, spiked water milfoil, has the flowers whorled, forming a spikelike whorl, the bracts pinnatifid and spike erect when in bud. It is a native of Europe and North America, in ditches, lakes, and pools, never in running water; it is found abundantly in Great Britain.

M. alterniflorus is, that in the drooping when in bud, and the fertile flowers in axillary whorls. It is found in ponds and ditches in Europe, in Great Britain rarely. A bout ten other species of this genus from various parts of the world have been described. They are found employed in medicine and the arts, and they are only worth cultivating in botanical gardens. When it is wished to grow the tropical species, G. Don recommends that small parts should be taken up in April or May, planted in the drooping when in bud, and be placed in the stove in order to preserve them in a living state during the winter, and in the course of the April or May next season, may again be returned to the pond in the same air, where they will thrive much better than if grown all the year round in pans of water or cisterns in a hot-house.

(Adams, Gardener's Dictionary; Babington, Manual of British Flora.)

MYRIRISTIS, a genus established by Cuvier for certain tropical fishes of the family of Perches. MYRIPLEON, a genus of large neotropical insects, of which the larvea are very distinct and exhibit a habit of entrap ing their prey by means of pitfalls. Among the many accounts which have been published of their operations, one of the best and most recent is that given by Mr. Westwood, in the Myripleon formiculaceus, is written that naturalist, with which I brought alive to this country from France, afforded me ample opportunities for watching its habits and modes of life, and the following forms are given to the genus and illustrated in the introduction. 'Some larve of the common species, Myr ripleon formiculaceus, writes that naturalist, with which I brought alive to this country from France, afforded me ample opportunities for watching its habits and modes of life, and the following forms are given to the genus and illustrated in the introduction."

Exsquitum post tergum magnum faciat parentis.

Precipitating in this manner, in a spiral direction, it gradually diminishes the diameter of its path, and by degrees throws so much of the sand away as to form a conical pit, at the bottom of which it then conceals itself, its mandibles widely extended being the only parts that appear above the surface; with these mandibles it deftly opens the mouth of the hole, the hole is immediately seized and killed. When the fluids of the victim are exhausted the ant-lion, by a sudden jerk, throws the dry carcass out of the hole; should, however, the insect by any chance fall down the hole, the latter immediately commences throwing up the sand, whereby not only is the hole made deeper, and its sides steeper, but the escaping insect is probably hit, and again brought down to the bottom of the pit. It is chiefly upon ants and other soft bodied insects these larve feed. They are however capable of undergoing long fasts, for one of my larve reared from October till March without food. Previous to assuming the pupal state, the larve forms a globular cocon of less than half an inch in diameter of fine sand, glued with silken threads spun from a slender telescop-like spinneret, placed at the extremity of its body, and lined with fine silk. The pupa is small, not being fifteen inches long, inactive, and with all the limbs laid at rest upon the breast. When ready to assume the perfect state, it uses its own mandibles, which are quite unlike those of the larve and image, to gnaw a hole through the cocoon, and pushes itself partly through the aperture in which it leaves the pupa skin. Immediately on assuming the perfect state, the abdomen is almost immediately extended to nearly three times its previous length. (See also the writings of Rosell, Reemur, and Bonnet and Guiding.)

MYRON, one of the most celebrated artists of ancient Greece, as the sculptor of the Discobolus, or Quoit thrower, of which that among the Towneley Marbles in the British Museum is supposed to be an antient marble copy, was born at Eleuthera in Boeotia about 480 B.C. Myron was the fellow-
pupil of Polyceuts under Ageleides; he was therefore in the prime of life at about the time that Phidias died; and he lived at the height of his fame in Athens, where he was domiciled, at the commencement of the Peloponnesian war.

Myron's fame rests upon his first obtained reputation by a brazen heifer, much celebrated by the poets, which gives Pliny occasion to reflect that men derive more good from the wit of others than from their own. He mentions a bronze of a discus-thrower; Persians have him to thank for a metope, and, as Böttiger explains pristis, sea-monsters; also a satyr admiring a flute; Minersa; Delphic pentathletes; pancra-
tiasts; a Hercules which was in the temple of Pompeius in the Circus Maximus. Also a statue of Mars; Myron also seems to have been restored to the Ephesians, being warned to do so in a dream.

Myron is said to be the first who represented in sculpture Nature in her multiplicity of forms: he represented man and animal with equal success; he almost, says Petronius (Satyr. c. 88), gave the souls of men and animals to brass. He was, says Pliny, more numerous and various than Polyceuts, but was not so exact in his proportions: he was curious in all corporeal detail, but paid little regard to expression: whether Pliny means this or not by the words 'ipse tamen corporum tenus curiosus, anima sensim non expressae,' it is one of these terebrats which would very well distinguish the vieing sculptor who was excellent in representing animals, a quality indicating a strong love of the variety of forms. Myron seems to have adhered in the head and face to the earlier types of rendering: without any particular feature in the formal manner of the earlier artists, which he much more probably did from taste than from any want of perception, as Pliny seems to imply.

At an observation of Pliny's, Winckelmann placed Myron back to the time of Anacreon and Eriina: Pliny supposed that an epigram of Eriina spoke of a monument to a grasshopper and a locust by Myron; this epigram is in the Greek Anthology, and is ascribed to Anyte, but the Myron, not Myron, there spoken of, says Sillis, is a virgin whose charms were sometimes fatal to her rivals. Myron executed many works consecrated to the gods, a number of which were preserved at Rome. Augustus placed four oxen in the portico of the temple of Apollo on the Palatine Mount, and a statue of Hercules is mentioned by Cicero as one of the works plundered by Verres. A statue of Apollo also, with the statue of Myron on the thigh in silver letters, was plundered by Verres from the temple of Bacchus at Agrigentum, where it had been consecrated by Publius Seipio: Pausanias mentions the Perseus killing Medusa. A great work by Myron was a group in the Heraeum at Samos, of Jupiter with Minerva and Her-
cules, one on each side, of which the figures were colossal: it was removed to Rome by M. Antonius, but the Minerva and Hercules were restored, turned his statue over, he added a statue of Jupiter he placed in the Capitol. A Bacchus is mentioned by Pausanias, which, he says, after his Eroctheus, was Myron's best work at Athens. The Athletes by Myron must have been very much admired, according to the pieces of inscriptions which describe them; this class, there is mention of several in Pausanias and other antient authors: as Ladas, a celebrated Lacedaemonian runner; two of Lycurus, a Lacedaemonian charioteer, at Olympia; Timanthes of Cleonos, a pentathlet, Philippon of Paleone, a juvenile pugilist; and one supposed to be Chloris of Lace-
daemon, also an Olympic victor, but denied by Pausanias to be Chloris (vi. 13).

All the above works were executed in bronze of Delos. Polyceuts used the Eginia bronze. But Myron was also a sculptor in marble, a carver in wood, and an engraver of metals. Pliny mentions a celebrated marble statue of a drunken old man, by Myron, which not being approved by Pausanias describes it by him a single-bodied Hecate with one head, in wood, which he saw on the island of Eginia: she was the chief divinity of the Eginetans according to Pausanias (ii. 90).

The discobolus, the son of Eileithys, was his Cow, lowing, and according to some sucking a calf; there are no less than thirty-six epigrams on this work in the Greek Anthology. No human figure has attracted so much notice, and diffuses so much celebrity, as a discobolus; Pausanias describes it as the most noble form, and as of a small size, and, however excellent, would have little effect compared with an isolated bronze, perhaps gilt, figure of the natural size, and fixed upon a marble pedestal in the centre of a public place. So according to Cicero it still stood in his time, though it was removed before Pausanias visited Athens, for he did not see it: in the time of Priscus it was in the temple of Peace at Rome. Ausonius wrote the following beautiful epigram on this work:

Bucullum sum, acelo gentioris fatus Myronis; nemo / acu factum me pote, sed gentilam. Signavit ictum; sine proximo magti; / Sic victor est ara, ubi mores prist. Mensas circumscribere cupit magister / Inter pascam te numine silet.

(Epigr. 56.)

The same idea is still more happily expressed in an old Greek epigram, inaccurately attributed to Anacreon; the following English version of it is from an old translation of Anacreon printed by Sir J. Curl, and is attributed to Fawkes:

This heifer is not, but rolling years / Harden the life to what it now appears. / Nature unjustly would the honour claim / But Nature has prevented him in fame.

Sonntag has collected all the numerous epigrams on this work of art. The Discobolus by Myron was one of the most celebrated works of antient art: the original was in bronze, but there are still several ancient copies of it in marble, though not one entire: one in the Campidoglio, one in the Vatican, and a third was in the Villa Massimi at Rome; that in the British Museum was found in the house of Hadrian near Temple, in 1791, and passed into the possession of Mr. Townley through the hands of Mr. Jenkins, a well-known dealer in works of art of that time. Some other trunks of antient statues, which have been very much restored, have been ascribed to Myron, and are of importance.

The Discobolus of Myron the head is noticed as being turned and looking back, as it does in some other of the reputed copies of this celebrated work. It must be observed however that there is no proof whatever that any of these marbles are copied from the celebrated Discobolus of Myron. The statue of Fea appears to have been the first to suggest the identity, which occurred to him from the similarity between the Massimi Discobolus and the Villa Palatina statue, both in 1782, and a Discobolus by Myron as described by Lucian and in part by Quintilian. Quintilian (ii. 13) merely alludes to its distorted position and elaborate execution; Lucian (Philoseudes 18) describes it more in detail; he says—'The Discobolus, in the twisted posture with the hand reversed and one knee bent, as if about to vary his attitude and rise with his throw, his head being turned to the right and the left, the boy holds the quoit;—the quoit-bearer,' which Fea interprets 'by the hand in which he has the quoit.' These words are however sometimes rendered 'the boy or girl who holds the quoit;' implying that the thrower was not yet in action, having only assumed his position. The quoit is also extended from the right to the left hand of the boy, as Fea from the bearer in attendance, who is implied only by the attitude of the Discobolus, not expressed. The Townley marble is however throwing the quoit, both knees are bent, and the quoit is held on the right. The quoit-bearer, as the Attic copies, are turned back: the action is perfectly momentary, and he is already giving the impetus to his throw. Barry preferred the forward direction of the head, as in this statue, to the turn spoken of by Lucian and seen in other statues of this subject, as much more consistent with the necessary impetus of the throw: he says—'The position of the head, hanging down in the same direction as the body, is very remarkable in Mr. Townley's figure, as it is a deviation from the original of Myron, as described by Lucian, and consequently from the Massimi copy, which corresponds perfectly with that description. In all other respects these figures agree, and this deviation appears to have been made, as in this way all ambiguity in the intention of the figure, by the direction of the eyes (which are not wanting in the action), is ingeniously avoided; and in finishing the action, at least an equal acceleration is produced by the head shooting upwards and forward, along with the other extremities.'

Myron had a son Lycius who was likewise a sculptor. He is mentioned by Pliny, and Pausanias (i. 28) says he saw in the city of Phigaelia a bronze by Myron, which he said was made by Lycius the son of Myron (Kühn and Ammianus read Anaxo in this passage): Pliny calls Lycius the pupil of Myron.

The Discobolus. Pliny, Historia Naturalis, X. 19; Xxvii. 5. 4; Justinus, Catalogus Articorum; Sillig, Catalogus Articorum; Sonntag, Untersuchungen für Freunde der alten Literatur, I. 100-119: Winckelmann, Werke, vol. vi.; Böttiger, Allgemeine Õber-
sichem und Geschichte der Plastik bei den Griechen, in his
Andeutungen zu Vorträgen über die Architektur; Göthe, Preussische Akademie, vol. i. See also Speccimen of am-
tienti Sculpture, published by the Society of Dibertii, vol. i.,
and vol. i. of The Townley Gallery of the Society for the
Diffusion of Useful Knowledge, in both of which the Diace-
bole of Thisbe can be seen.

MYRRH, a genus of plants belonging to the natural
order Umbelliferae, and to the tribe Scandiceae. It has
an obsolete calyx; obcordate petals, with an infixed point;
the fruit not beaked, the capsule covered with a double membrane;
the outer membrane with elevated keeled ridges hollow within,
the inner one close to the seed; no spines. The species have
leaves three times decomposed, the leaflets pinnatifid;
the involucral bracts lanceolate cym-
ated leaves, the central flowers of the umbel stamini
fere; the petals white.

*M. odorata*, Sweet Cicerel, or Great Chervil, has the
leaves downy beneath, the leaflets of the partial involucres
lanceolate acuminate. This plant has a stem 2 or 3 feet high,
round, leafy, and hollow. It is native of Middle and South
Europe and Asia, from Spain to Asia Minor, also of Germany,
Switzerland, Austria, the South of France, and the North of
Italy. In Great Britain it is found in pastures and hilly
districts. This plant was formerly much used in medicine.
It yields a volatile oil, which has a pleasant odour. The young
leaves were frequently used in salads. The roots were
boiled or eaten cold, or in tarts or in a variety of sauces.
In Germany the seeds were added to soups, and in the North
of England they are employed for polishing and perfuming old
oak floors. The flowers are white, the involucral bracts
acuminate, and the seed is a native of Spain. Both species may be grown in
any common garden soil, and propagated by seeds or division of
the roots.

(Myrtus, Manual of British Botany; Burnett, Outlines of
Botany.)

MYRTUS (Greek, μύρρος), a genus of plants, the type
of the natural order Myrtaceae. It has the calyx-tube somewhat
globular, the limb 5- or very rarely 4-partite; the petals
5, or very rarely 4; the stamens distinct; the berry 2- or 3-
celled, somewhat globose, crowned with the segments of
the calyx; several seeds in each cell, or very rarely solitary;
uniform, with a bony testa; the embryo curved, coryledons
semicilindrical, very short, the radicle twice the length of
the cotyledons. The species are shrubs with opposite quite
entire pellucid-dotted leaves; peduncles axillary 1- or rarely
3-flowered.

*M. communis*, Common Myrtle, has solitary 1-flowered
pedicels about the length of the leaves, bearing 2 linear
bracteoles under the flowers; the calyx 5-toothed; the leaves
ovate to orbicular. This bears the name of a native of the
south of Europe; it is found wild in France about Mar-
selles, and extends from that city along the sea-coast to
Génes, and throughout Italy. In these districts its fruit is
tasted by the natives. The berries grow without the shrubs of the
sea. This plant has been in all ages a great favourite in
Europe. It was called by the Greeks μύρρος. Μυρίγνιον is
the name under which Hippocrates refers to this plant
(Marc. Milt. i. 598). Theophrastus also uses this word and
μυρίγνιον and μυρίς, in speaking of the myrtle.
The Romans knew this plant by the name of *Myrtus* (Plin.
12-13). This name has been adopted in most European
languages: it is *Mirta* in Italian and Spanish; *Murre* in German;
*Müter* in Danish; *Myrten* in Swedish; *Mirte* in
French; *Murta* in Portuguese.

The leaves of the myrtle, like the whole order, contain
a volatile oil which possesses medicinal properties, and they
were used as stimulants by the antients. The buds and
berries of this plant also contain volatile oil, and were
used by the antients as a spice, and are at this day, in Tuscany,
employed as a substitute for pepper. The Tuscanos also pre-
sare a kind of wine from the myrtle called myrtadunam.
The berries are used at the present day in Greece as a
remedy in the diarrhoea of little children. The mode of
administering is to soak them in vinegar, and when distilled
they form the perfume sold in France under the name of
*Ée d’Ange.* In addition to a volatile oil the myrtle
contains two other substances in medicine of varying parts
have an stringent action, and have been used for this purpose.
In Greece, Italy, and the South of France, the bark is used for
tanning.

The myrtle is a half-hardy plant in this climate, although
many individuals have lived and borne our winters for above a
hundred years. The myrtle appears to have been introduced
into England in the sixteenth century. There are at the
present time many fine myrtle-trees in Great Britain and Ireland.
At Cobham Hall, in Kent, there are several specimens 50
feet high. In the Isle of Wight it forms the hedges of many
gardens. The fruit is not eaten, but may be cultivated by-protection during the winter. Several varieties of
the Myrtus communis are found in gardens, of which the
following, from Don’s "Gardener’s Dictionary," may be
regarded as the principal.

*M. malacocarpa* (D. C. Prod. iii. p. 239), fruit blackish.
This variety of myrtle is frequent in the south of Europe and
in gardens, where there are varieties of it with double flowers
and variegated leaves.

Var. a. Romana (Mill. p. t. 184. p. 1), leaves ovate;
pedicles elongate. The common broad-leaved or
Roman myrtle. It is sometimes called flowering
myrtle, because it flowers more freely in England than
any other variety.

Var. b. Tarentina (Mill. Dict.), leaves ovate;
berries rounder. The box-leaved myrtle. Flowers
small, and open late in the autumn. Leaves small.

Var. c. Italica (Mill. Dict.), leaves ovate-lanceolate,
acuminate; branches more erect. The Italian or upright
myrtle.

The orange-leaved myrtle.

Var. e. Lusitanica (Lin. Op.), leaves lanceolate ovate,
acuminate. (*M. acuta* Mill. Dict.) The Portugal
myrtle

Var. f. hortensis (Mill. Dict.), leaves ovate-acuminate; the nutmeg myrtle appears to be only a
variety of this.

Var. g. Belgica (Mill. Dict.), leaves lanceolate acuminate.
The broad-leaved Dutch myrtle. Leaves ovate, dark green.
The double flowering myrtle appears to be of this variety.

Var. h. ensiflora (Lin. Op.), leaves linear, lanceolate,
acuminate. *M. minima* (Mill.), rosemary or thyme-
leaved myrtle.

Native of Greece and the Balearic Isles. The fruit of this is
rather large, edible, with a grateful taste and smell.

The above varieties are constant; but there are others in
the garden which are more variable. It will suffice to give
the names of a few of these.

1. Gold-striped broad-leaved myrtle.
2. Broad-leaved Jew’s myrtle. This variety
frequently has its leaves in threes, on which account it
is said to be in esteem among the Jews in their
religious ceremonies.
3. Lanceolate, striped orange-myrtle.
4. Silver-striped Italian myrtle.
5. Striped box-leaved myrtle.
7. Striped rosemary-leaved myrtle.
8. Cocksemb, or bird’s nest myrtle.

About forty other species of myrtle besides those of the old
genus Myrtus now referred to the genera Myrica, Syzygium,
Eugenia, &c., have been described. None of them yield
products used in arts or medicine, and only a few of them have
been cultivated.

*M. tomentosa* is a native of Cochín China. It is a handsome
shrub, and has been found to grow well against walls in the
south of England.

*M. nammalaria* is a creeping species found at the Straits of
Magellan; and *M. myrtoidea*, a native of the colder parts of
Peru, would probably be found to be half-hardy in this climate.

The species of the genus Myrtus grow well in sunny
places, and cuttings readily strike roots in sand or mould.

(Don, Gardener’s Dictionary; Loudon, Arboretum Brit.;
Frans, Synopsis Florae Classicae; Burnett, Outlines of Botany;
Lindley, Flora Medica.)

*MYRTY*. The family is native of Asia. The type
is *Myrtus communis*, a native of the Hague, where he
was born about 1560, was the best portrait-painter in England
during the reign of James I., and previous to the arrival
of Vandyck, to whom he was little inferior. He was in England
in the time of the civil war, but attained to great cele-
brity until he was appointed one of his court painters by
Charles I. in 1625, with a salary of 20l. per annum, and in
the following year he received in addition 120l. for pictures
painted for the king. Mytens now executed many portraits
of royal and distinguished personages, some of which are at Hampton Court; and he was in great favour until about 1632, when he was so much discontented at the favour shown by the king to Vandyck, that he solicited Charles for leave to retire to his own country, but the king, learning the cause of his dissatisfaction, entreated him to remain, and told him that he should have work enough both for him and Vandyck. Mytens remained, but apparently for a short time only, as none of his works in England bear a date subsequent to the arrival of Vandyck. The two rivals however parted apparently on good terms, for Vandyck painted the portrait of Mytens, and it is engraved in the collection of Vandyck’s portraits, by Pontius. Mytens returned to the Hague, and was still living there in 1636, when he painted a portion of the ceiling of the town-house of that place. His style was bold, firm, and natural, his colouring mellow and harmonious, and his pictures are frequently enriched by warm landscape backgrounds. There are many of his portraits at Hampton Court, of which the full-length of James, first Marquis of Hamilton, is an excellent picture: there are here also Prince Rupert when a boy, and the dwarf Sir Jeffrey Hudson, who, when seven years old, was served up in a pie at Burleigh, at an entertainment given by the Duke of Buckingham to Charles I. and Henrietta, and was presented by the duchess to the queen, who kept him as her dwarf. Hudson was then only eighteen inches high; he grew, after he was thirty, to the height of three feet nine inches. Mytens introduced this dwarf in a large portrait of Charles and his queen, which was in the possession of the Earl of Dummore. Sir Jeffrey died a prisoner in the Gate-house, Westminster, in 1682, aged sixty-three: he was imprisoned upon suspicion of being concerned in the Popish Plot.

(Walpoole. Anecdotes of Painting, &c.,)

**MIXYNA**, a genus of cartilaginous fishes, of the order **Cyclostomi**. It is synonymous with the **Gastrobranchus of Bloch**. The **Myzine glutinosus**, or glutinous Hag, is the type. This curious animal is shaped like an eel, and measures when full grown about one foot and a half. The head is scarcely distinguishable from the body, and is obliquely truncated in front, terminating in a large round mouth, the frame work of which is a membranous maxillary ring, furnished above with a single tooth. The tongue is furnished on each end with two rows of strong teeth. Eight filaments surround the mouth. In the middle of its superior margin there is a single round spiral thread. It has no eyes. The branchial openings are two, and are estimated at about one-fourth the length of the body, below the mesial line. The skin is naked, and very slimy. Along each side of the belly there is a row of pores, which furnish the mucous secretion. An obscure fin runs along the hinder portion of the back, is continued round the compressed tail, and beneath the anal opening, which is placed upon the hinder side of a dark bluish-tinted column, and which is white beneath. The **Myzine glutinosus** is not uncommon in the Scandinavian seas, and is frequently taken off the north-east coast of Britain. It enters the mouths of fishes caught off the line of the fishermen, and eats up all the soft parts of their bodies, leaving only the skin and bones.

The very anomalous characters of this fish have at different times caused naturalists to place it in more classes than one. Thus Linnaeus classed it among Verruca; Modeer, among Amphibia; and O. F. Müller among Molliacea. That it is a true fish, though very low down in the series, has now been placed beyond doubt. It has furnished the subject of many elaborate essays. The most valuable is the celebrated memoir on the Anatomy of Myzinoidea, by Professor John Müller, published in the Transactions of the Berlin Academy for 1834, illustrated by admirable anatomical drawings. In that memoir the author proposes the following arrangement of the cartilaginous fishes, in which the exact position of **Myzine** and its allies in the series is well shown.

**CHONDROPTERYGII**.

**Skeleton cartilaginous, cranium without sutures.**

1st **Order.** **BRANCHIOPTERA.**

1st Family, **Cataphracta.** Cartilage of the cranium, and skin of the trunk covered at intervals with cartilaginous tubercles.

**Sturiones.** Genus 1. **Sturio.**

2nd Family, **Nuda.** Body without tubercles.

**Scotopterygia.** Genus 2. **Scotopterus.**

2nd **Order.** **HOLOCEPHALA.**

Genus 1. **Chimaera.**

Genus 2. **Cithorhynus.**

3rd **Order.** **PLAGIOPTEROMATA.**

1st Family, **Squali.** The branchial apertures not attached to the head.

Genus 1. **Squalus.**


4th **Order.** **CYCLOPTEROMATA.**

1st Family, **Hydropsia.** Palate imperforate.

Genus 1. *Petroglossum.*


(Müller enumerates only one species, the **Myzine glutinosus** of the northern seas. A representative species has since been made known from the Antarctic seas.)

Genus 2. *Beloellota.* (The fishes of this genus differ from the Myxine in having eyes, and more than one branchial spiracle.)

(Müller enumerates four species as certain, viz. : B. hexastroma and B. heterotrema from the Cape of Good Hope; Heterotrema from the South Sea, and Forsteri from New Zealand. B. Donwegi is regarded as doubtful.)
NAGPOOR, a district formerly included in the province of Berar, in Hindustan, but now in the adjoining province of Guandwana, of which the city of Nagpoor is the capital. Ellipoor is the capital of Berar. The palace and seat of government of the raj of Berar is at Nagpoor, and hence he is as frequently styled the raj of Nagpoor as the raj of Berar. The state of Berar, or Nagpoor, is one of those over which the British authorities hold full political sway, with right of intervention in case of internal disturbances, and they have a political agent resident at Nagpoor. The British government is bound by treaty to protect the raj of Nagpoor, and he is bound to pay the British an annual subsidy of 80,000L, to maintain five regiments of infantry and four regiments of cavalry, and a contingent force of 1000 cavalry to co-operate with the British in case of war. The area of the state is about 64,000 square miles, the population about 2,600,000, and the estimated revenue 350,000L. That portion of Berar which lies to the west of the river Wurdah is included in the territory of the Nizam of Hyderabad; and the title of rajah of Berar is a hereditary one, the present one being rarely able to work comfortably with another man's hammer; and hence, he observes, 'as they are somewhat given to tramping from place to place, each workman generally carries with him a hammer and a chisel, and can form anything which weighs about two pounds, he makes, including the cutting up of the nail-rod into convenient lengths, and re-uniting them when they became too short, no less than 1,083,856 feet and from the first to the last of the nails, which were heated 42,836 times. This task, is, Holland states, allowed to have been as much as three ordinary men could perform without difficulty.'

For some purposes nails formed by the much cheaper process of casting have been long used instead of those wrought in the manner above described. Common cast nails are, however, so clumsy and so brittle that they can only be used for a few coarse purposes, as in plasterer's work, and in the nailing up of fruit-trees. By the introduction of great improvements in the manufacture, however, a very useful kind of cast nail, of an exceedingly pure material called malleable iron, has been successfully introduced for certain descriptions of workwood. Nails of this kind are very neat and regular in their appearance, being cast with great accuracy; and they are anodised to such perfection that the metal will bear far more bending than ordinary wrought-iron without injury. This extraordinary degree of tenacity is, however, obtained at the expense of rigidity, such nails being often nearly as soft as copper, and therefore quite unsuitable for use in hard woods.

The comparatively high price of wrought nails, owing to the great amount of manual labour required in making them, and the insufficiency of cast nails as a substitute for them, has led to the introduction of many highly ingenious machines for forming nails by cutting, stamping, or compression, out of plates or rods of rolled iron, and with such success that, for the ordinary purposes of the carpenter and joiner, cut-nails, varying in size from the smallest tack or brad up to spikes of six inches or more in length, have almost superseded those wrought by hand, which like the Batlaves' 'Perfection on Nails,' the Encyclopaedia Metropolitana, the earliest machine for nail-making was that contrived by Mr. French, of Wimborne, Staffordshire, in 1790, in which no material pressure was made, but the only operation consisted of making nails by the hammer, but labour was saved by working hammers by water-power, so that women and children might perform work which would otherwise have required the strength of men. Barlow describes the machine as being in which the various processes of rolling, pressing, stamping and cutting are introduced; but for the details of such machinery we must refer to his work, 'The Baths of Holland for Fire and Art,' Heber's 'Dictionary of Arts,' and Heber's 'Engineer's and Mechanic's Encyclopedia.' Dr. Ure attributes the invention of cut nails to the citizens of the United States, observing that, according to a report by the secretary of the House of Repre-
chametsis, so long since as the year 1810 they possessed a machine which performed the cutting and heading at one operation with sufficient rapidity to cut out more than 100 nails per minute. In the process now most commonly followed nails are cut from sheet-iron of suitable thickness, which is first reduced, by cutting transversely, into strips or rails sufficient to be equivalent to the number of the nails.

These strips are then applied to a machine in which a chisel-shaped cutter descends with sufficient force to cut off from the end of the strip, at each downward stroke, a narrow piece sufficient to form a bevel. As the nail is driven into the face of a tapping form, the cutter must be so fixed as to form a slightly oblique angle to the direction in which the strip is pushed into the machine, and this obliquity must be reversed or the nail will be beveled on one side only. This machine was adopted in comb-cutting machinery. [Coma, P. C. S. P., 1898.]

If the nails are to be of any of the kinds to which the term nail is specifically applied, as distinguished from brads, the action of the cutter is simply reversed, so as to reduce the strip of iron into long, wedge-shaped pieces, and the pieces thus separated are subsequently headed by pressure or stamping, so as to form finished nails; but if the nails are to be of the kind, the action of the cutters must be so modified as to produce cuts alternately at right and oblique angles with the edges of the strip. Nails of this kind need no subsequent heads, but would be soldered by the application of the eye of the nail. The accuracy with which this operation is performed may be seen by laying together side by side, heads and points alternately, a number of cut nails or brads, when it will be found that they really do resemble a regular regular.

In some regularities the cutters do not vibrate or vary their position, but the strip of iron is turned between each cut, so as to produce the same effect. Brads are frequently cut out of hoop-iron instead of transverse strips of sheet-iron, as above described; but the practice is much to be deprecated, although the brads so formed have a rather neater appearance than others; for it is evident that all, in the operation of rolling, the fibre of the iron is laid transversely in the strip, instead of along the nails cut transversely from it, thereby rendering them very weak and brittle. The advantage derived from the superior squareness of cut nails, as compared with wrought nails, is alluded to above.

Some peculiarities of considerable importance is that, as much nails are usually tapered in one direction only, their points are somewhat chisel-shaped, and, though sharp, as broad as the body of the nail. If, therefore, such a nail be placed with its chisel-shaped point across the grain of a piece of soft wood, it may be driven in without boring, and without the risk of splitting, which would arise if the nail were, as most wrought-nails are tapered on every side.

In some of the coarser operations of carpentry nails are secured by clinching, or bending down their points with the hammer; but they are driven commonly through with their heads intended to hold together. Hebert notices a very neat and secure substitute for this rather clumsy expedient, which consists in placing on the projecting end of the nail a little ball of common iron called a black ball, and then clinching or riveting the end of the nail down upon it. He states that this mode of fastening appears, though without reason, to be almost entirely confined to boat-building.

Nails of iron with ornamental brass heads are much used for hanging pictures upon, and for other purposes in which the heads of ordinary nails would be unsightly; and nails wholly formed of brass, copper, or brass and copper alloys, are used in ship-building, and for a few other purposes. For the mode of coating small iron nails or tacks with tin, for use in cases where rusting is injurious, see N. Kitchevan. [Examinorlay, P. C., 1842.]

NANTEUIL, ROBERT, a celebrated French engraver and draftsman, was born at Rheims, in 1630, and was the pupil and friend of his brother, N. Raimond. He engraved chiefly portraits, in which class he is one of the most distinguished engravers, though he generally engraved the head only, without accessories; but he frequently executed them of the most enlarged and spirited kind—so took an interest in length of life in passing it in a very able manner; but as he used these chiefly to engrave from, few of them have been preserved. He engraved in line and in stipple, and generally combined both styles, stipple being his favourite mode. He endeavored to express colour, and to a considerable degree in his prints. Nanteuil died in 1678, and though he lived to the age of forty-eight only, he has engraved nearly 800 plates, almost exclusively portraits, and comprising many of the princes of Europe, and most of the celebrated men of France during the reign of Louis XIV., of whom the author has written a life in each of the principal periods of his life. His master-pieces are J. B. van Steenbergen, after Duchatel, known as l'advocat de Hollande, 1608; M. de Pompeonne, after Le Brun; D. M. le Mothe de la Vuye, after Lorraine; and a portrait of an old lady, in the possession of Mr. H. J. M. de la Porte. [Welette et Levesque, Dictionnaire des Arts, &c.; Heber, Manuel des Amateurs, &c.]

NARDOSTACHYS, a genus of plants belonging to the natural order Valerianaceae. The limb of the calyx is 5-parted; the lobes ovate, oblong, acute, leafy, somewhat toothed and permanent. The corolla is regular, ecalcarate, usually 5-lobed and bearded in the throat. There are four stamens, which are closely united and vary; the anthers are oblong, and the filaments are herbs with sweet-scented perennial roots, which are beset with erect flers at the neck.

N. lowii or a large herbaceous plant with a long hairy tap-root. The stems are perennial, very short, and simply divided into a number of shaggy, scaly crowns, from which the leaves are produced. The branches erect, downy, and a few inches high. Leaves oblong, lanceolate, rounded, downy; those at the base acute, the upper ones obtuse. The flowers are of a pale pink colour, clustered in the axils of the upper leaves, which form a kind of involucres for them. It is native of New Zealand, the Sandwich, and in Dublin, Bengal, and Deccan. This species is the true Spikemead of the ancients, and is esteemed not only as a perfume, but as a stimulating medicine. Oriental writers give it as a remedy for a multitude of diseases. It seems to be really valuable in cases of epilepsy and hysteria.

N. grandiflora is a prolific species, long glabrous leaves, with solitary terminal flowers. The capsule is downy, and the lobes of the calyx evidently dentilicate. It is native of Nepal and Kumaon.

These plants should be grown in pots, in a mixture of loams, peat, and sand, and placed among other Alpine plants. They may be propagated by cuttings or by seed.

(Don, Gardener's Dictionary; Lindley, Flora Medica.)

NARTHIECIUM, a genus of plants belonging to the natural order Juncaceae. The perianth is partly coloured, of 6-linear lanceolate persistent leaves. The filaments are woolly, and the style undivided. It has a simple obtuse stigma. The capsules pyramidal, 3-celled and 3-valved. The placenta extends only a short distance up the inner edge of the dissection. The seeds have a long villous appendage at each end.

N. ocefrangum, the only British species, has linear sword-shaped leaves, pedicells with one bract at the base, and another above the middle. The perianth longer than the stamens, and considerably shorter than the capsules. The flowers are bright yellow. This species is distinguished especially by its seeds dry and naked.

(Babington, Manual of British Botany.)

NASIREANS. [NAZARENES, P. C.]

NASMITH, DAVID, was born in Glasgow, on the 31st of March, 1765, and was apprenticed to a tinsmith at the age of sixteen he made a public profession of religion by joining the church in Nhill Street, under the pastoral charge of the late Rev. Dr. Grose. He was born in Sighthill, near Glasgow, on the 27th of December, 1765. He had a great exertion to prepare himself for the Christian ministry; but as his friends did not encourage the attempt, he returned to secular employment, but engaged with great zeal in Sunday-school teaching the establishment of adult schools, the subsequent instruction of prisoners, and other philanthropic efforts. In the autumn of 1821 an event occurred which, by affording enlarged scope for his benevolent desires for the religious and moral improvement of his country people, was all in direct development of a character which, for disinterested devotedness, has been rarely equalled. 'The conductors of the various religious and benevolent societies in Glasgow,' observes Nasmyth's biographer, 'had to express a deep sense of the services of Sir George Taylor and his friends, and of the untiring and indefatigable zeal and perseverance with which he had laboured in embracing the most honourable and noblest of offices, and of the invaluable services which he had rendered to the community and to the country.'

In the completion of their plan required the services
of an active secretary, who should be common to them all. In answer to an advertisement for such an officer, Nasmith offered his services, and in the first year of his employment, devoted sixty pounds, though the interests of twenty-three societies thus devolved upon him. In this office he was brought into frequent communication with committees composed of ministers and laymen, making the establishment of local missionary societies his especial care, and he gained the personal esteem of many of the most eminent men of Glasgow; and the remarkable course of mental training thus afforded had the effect of fitting him for the singular career he was subsequently to pursue. To this biography attributes 'the free, easy, and noble air' by which he was distinguished in after life, and to which he appears to have been largely indebted for his influence over men who were strangers to his person, and who, in many cases, he was inclined to regard his projects with prejudice and distrust. 'Even on the first interview,' observes Dr. Campbell in the 'Memoirs' upon which this article is chiefly based, 'no stranger could escape the impression that he was a man of extraordinary integrity and sagacity, piety and benevolence.'

'Mr. Nasmith,' observes Mr. Astbury, 'was a man of consummate ability and tact in the formation of societies.' 'It was,' he remarks, 'his great talent;' and it was manifested in his power of 'directing a committee without assumption on his own part, patiently attending to the various opinions of members, and gradually shaping the committee to his own decisions, and gently intimating his own judgment, which, being founded on great experience, was generally adopted.' In this office he also, to return to Dr. Campbell's account, 'obtained a very distinguished character for management, and when he left his charge he had discovered its wants; he saw directly before him the amount and character of the agency provided for the supply of those wants; and hence he ascertained how much of those wants remained unprovided for. While faithfully discharging his onerous duties in connection with the existing philanthropic societies of Glasgow, Nasmith applied himself also to the formation of such new associations as were deemed necessary for religious, scientific, and charitable purposes, and so contributing to the welfare of that and other populous places. Young Men's Societies, or associations for promoting the religious interests of young men, whether in the form of a trade union or a co-operative union, or both, from their position, and in that of a resident in a large town, and for directing their united energies into channels of benevolent exertion, occupied then, as in his later years, a large share of his attention; and in a letter upon the subject addressed by him to Professor Buchanan in February, 1826, he states that he had been the means of forming about seventy such societies, in the United Kingdom, France, and America, since the close of the year 1823. A still more important project, and one which has proved far more extensively successful in practice, was the formation of city and town missions, or societies for carrying religious instruction, by means of lay agents wholly devoted to the active support of their work, into those districts into the very haunts of vice and dissipation. Attempts had been previously made in a few instances, and on a small scale, to accomplish this object; but the difficulties of the task, especi- ally in the case of town missions, had been so great, that the attempts of the Christian Church, had impeded their success. In spite of such difficulties, Nasmith succeeded in establishing, at the commencement of 1826, the 'Glasgow City Mission,' which, though commenced by the congregation to which he belonged, was constituted on a systematic footing, that, before the end of its first year, eight evangelical denominations of Christians were united in its management, and eight missionary societies were employed. The success of this society encouraged Nasmith to print and circulate widely, not only in the British Islands and America, but also in France and other parts of the continent of Europe, a brief account of its design, with testimonials of its usefulness. In the same year Nasmith married Miss Hartridge, a native of Kent, who was then residing in Glasgow, and who became a most valuable coadjutor in his benevolent designs. In 1828, his health being impaired by the arduous duties of his office, Nasmith resigned his connection with the Institution House at Glasgow, and from that time until his death he devoted himself wholly to the exercise of work for which he was better fitted. His public character and name were then fully known among the agent or missionary, travelling from place to place to promote the establishment of city and town missions, young men's societies, and other kindred institutions. He chose his work, and missions for such an undertaking was of no ordinary character, since it involved the relinquishment of any settled means of obtaining a livelihood, and of all prospect of obtaining a station to which his talents entitled him; while he had no property on which to rely even for travelling expenses, nor any society on which to fall back for support. His first removal was to Manchester, followed by Birmingham, and then to the prosperous city of London. Having subsequently visited London, and his wife's family in Kent, he returned to Glasgow, and thence again to Dublin, where he formed a society for promoting the extension of local missions. In 1829, he returned to London, and whence, in 1829, he proceeded on a tour through the south of Ireland, establishing missions in Cork, Limerick, Waterford, and several other places. In the following year he performed a similar journey, with the like result. In 1830, he returned to the north of Ireland, after which he returned to Glasgow, and prepared for a voyage to the United States on the same benevolent errand. Arriving at New York in September, 1830, he formed a city mission there, and continued it for about three months' duration, visiting and establishing similar societies in many towns in the United States, after which he returned to New York, sailed to New Orleans, made some visits in Philadelphia, and afterwards, preparing for a third time at New York, proceeded to Canada. How completely disinterested Nasmith in these travels may be seen from the fact that while his necessary expenses were defrayed in New York, when he first left his native country for Ireland, to December, 1831, when he returned from America, where he travelled about 3000 miles, amounted to rather more than 67L, a sum wonderful when considered that he was deprived of the benefit of his scanty resources. Fecund difficulties, however, could not repress his ardour, and it was not long before he visited Paris and established a Christian mission there, and set on foot a similar establishment in Scotland. He studied in Edinburgh, and in March, 1835, fulfilled a long-cherished intention of removing his residence to London, for the purpose of establishing a city mission. His enterprise, observes Dr. Campbell, 'was not preposterous. Many of the best friends of the object at which he aimed deemed it utterly hopeless to effect that object by the means of a single society or of different sects; but he secured joint efforts of churchmen and dissenters. Nasmith, who was of too catholic a spirit to care to what section of the Christian Church his fellow-labourers belonged, so that they were real Christians and united in the desire to impart the highest benefits to their fellow-men, and who, indeed, in answer to inquiries respecting himself, would say 'I am a Catholic Christian,' neither suffered objections or difficulties or impediments to deter him from his aim, nor to induce him to lessen its moral grandeur by identifying it with sect or party. The London City Mission was therefore commenced in conformity with the design of its founder, but without the active support of a single sect. It is still in being and flourishing, and, afterwards, finding its fears groundless, heartily united to carry it on. Operations were commenced with only four missionaries, with salaries amounting in the whole to 297L per annum; but so large has been the progress, that in 1845, at the date of the tenth annual report, the number of missionaries employed was 121, and the expenditure in salaries alone for the preceding year had been 2400L, exclusive of all other expenses incidental to the mission. In the same year the number of domiciliary visits, and visits to hospitals, asylums, and other places where the poor and ignorant are con- gregated together, paid by the mission, amounted to 544,908, of which 39,469 were to the sick and dying. In a majority of the latter class of visits the agents of the city mission were the only individuals by whom religious instruction and comfort were carried to the bed-side of the sufferers. The distribution of Bibles and religious tracts, the holding of religious services in neglected neighbourhoods, and various other benevolent operations, are also carried on by the missionaries, and special provision has been made for the appointment of agents suited to their peculiar necessities, for the spiritual wants of cab-drivers, and of the numerous Lucerne, Germans, and other foreigners in the metropolis, and for the comfort and relief of the most wretched and abandoned, the missionaries have obtained access, and often with the best results, to homes of misery and vice which no other agency has been able to approach. They have been agents of moral police, of the efficacy of which the reports of the society and the documents published monthly in the 'London City Mission Magazine' afford abundant proof. One missionary alone, in Clerkenwell, has, according to the report above quoted, seen

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NA U C L E A, a genus of plants belonging to the natural order Rubiaceae. It has a calyx with an oblong tube and a short truncate or 6-toothed ovate, mitten-shaped, with a slender tube, a naked throat, and 5 spreading oval oblong lobes. The anthers are inclosed, and always shorter than the lobes of the corolla. The capsules are 2-valved, subglobose, or oblong-globose, and when the seeds are ripe they open towards the base. The seeds numerous, imbricate, winged, fixed to oblong placenta, which are adnate to the dissepiment. The embryo is invested in a silky albumen. The leaves are ovate-oblong, or oblong-lanceolate, with rounded or acute base, and wavy or dentate, or entire at the base, of the head of flowers, but with linear palea among the flowers, which are crowded and sessile. The species are unarmed trees, rarely shrubs, and natives of India and tropical Asia.

N. Cadamba has bracteate branches, petiolate, coriaceous, ovate leaves, triangular stipules, terminal solitary peduncles, usually shorter than the heads, which are globose. The flowers are corolla-coloured, corolla of the size of a small apple. The style is white and exserted. The seeds not winged, the leaves from 6 to 10 inches long.

Kuching is one of the oldest of the places of the interior, it is bounded on the north by the river Kuching, on the south by the mountains Calcutta and Malabar, where it grows to be a very large tree, and is ornamental and very useful from the extensive shade it affords.

N. perpsefolia has petiolate obovate oblong leaves, oval stipules, and terminal solitary peduncles; sometimes the peduncles are in tripods, when the middle one is the shortest. It is native of the East Indies and all the coast of Coromandel, but chiefly in the mountains of the Philippines. The flowers are light yellow, and globular, about the size of a plum. The wood is of a pale chestnut colour, firm, and close-grained; it is useful for purposes where it can be kept dry, but when it is not dry it will swell. A true element for cabinets.

N. cordifolia is prized on account of its wood, which is light and durable where it can be kept dry. It answers well for furniture. There are thirty-seven species of this genus in the Indo-Malayan region, of which at least nine possess any peculiar qualities which entitle them to particular notice. They are of easy culture. A mixture of loam, sand, and peat is the best soil for them, and they readily take root under a hand-glass in the same kind of soil.

The Nauclea Gambia of Hunter (Linnaean Transactions, vi. ix.) is now Uncaria Gambia. (UNCARIA, P. C.)

NAU C R A T E S, a genus of fishes of the mackerel tribe having fusiform bodies, tails heeled at the side, and two free spines before the anal fin. The N. acus raptor is probably known as the Pilot Fish, and is remarkable for its habit of following vessels often for many hundred miles. Mr. Crouch, in the 14th volume of the 'Linnean Transactions,' has recorded an instance of two individuals of this species which accompanied a ship from the Mediterranean to Boston, whereas they were taken by a net. The N. acus raptor is about a foot in length, and is remarkable for the beauty of its colour, being of a silvery pale blue banded by broad and deep transverse dark blue bands. The young possess this beautiful tint. Mr. Traub, the brother and master of the younger Polycterus of Argus, and of the N. N. A U C Y/DIE (naucyd), a Greek sculptor, who was born at Argos, and was in repute, according to Pliny, about 650 B.c. He was the son of Philocles, the brother and master of the younger Polycterus of Argos, and of the Younger Polycterus. He was one of the most important artists between Alcamenes and Praxiteles. Pliny mentions a Mercury, a Discobolus, and a man sacrificing a ram, by him. Pausanias notices six
other ci... works: a Hebe, in ivory and gold, placed near the celebrated chryselephantine statue of Juno at Myconae by Polykleitus, and two Aratas and four victors at the Olympic games, one of Euclees at Rhodes, two of Chionos, one of which was at Olympia, the other in the city of Tenedos; Neacles defaced the palm-tree of Nearchus, and another Bacis the wrestler. A tenth work by Naucrates, a bronze statue of Erinnis, is mentioned by Tattian. The two statues of Chionos were, according to Pausanias (vi. 9), his best works; but, when new set up, they were so well known Discobolus in repose, standing with the quoit in his hand, is sometimes called the Discobolus of Naucrates, but without the slightest foundation.

NAUTON, SIR ROBERT, a diplomatic statesman, was born in 1593, and was the son of Henry Naution of Alderton, in Suffolk. He studied at Trinity College, Cambridge. He attended his uncle, William Ashby, when he was sent as ambassador by Queen Elizabeth to Scotland in 1649, and being sometimes trusted with the management of important business connected with the mission, was then initiated in diplomatic life. In 1596, he was sent by Essex to France, with letters to Antonio Pérez, formerly Spanish secretary, probably with a view of securing the services of three Venetian adventurers, Zauli, goboso, senapiti, or at least of sounding their intentions. Returning home, he was, in the same year, appointed tutor to a young gentleman named Vernon, of whom the Earl of Essex was guarantor. He proceeded to France in 1597, to repeat the mission to France, in company with the French ambassador, the Duc de Bouillon; and it is manifest that the object hidden under his appointment, and his journey, was to give Essex the services of a man who might take a hand on the French court. He seems to have been naturally of a candid disposition, which did not easily mould itself into the plant morality necessary for successfully conducting the flagitious diplomacy of that age. He wrote many complaining letters to his patron. 'The best allowance of credit I can have,' says he in one of them, 'is but in nature of betwixt a pedagogue and a spy; both trades I have not, nor can I find any eyes but those of their eyes with whom I live as my own.' After the fall of Essex, little seems to be known of him, until 1614, when he reappears as member of Parliament for Helston, a favourite of 'King James on account of his scholarship, and one of the persons patronised by Buckingham. He was sworn Secretary of State, on the 8th of January, 1618. Having afterwards opposed the favourite's friend, Gondomar, the Spanish ambassador, he was deprived of office, but he was subsequently appointed Master of the Court of Wards. He died on Good Friday, 1635. His 'Fragmenta Regalia: memoirs of Elizabeth, her court, and favourites,' was greedily perused in manuscript, and frequently referred to, and quoted in 1641. It has passed through several editions. This little book is remarkable as one of the very few which in that age noticed political events and characters in their relation to the court, and preserved the documents by which a writer brought to bear a sagacious and artistic style.

(Trans. prefaced to Fragmenta Regalia, 1684.)

NEALCES (Nealxen), probably of Sicyon, a celebrated Greek painter, contemporary with Aratus of Solconyr, about 213 B.C. Few of his works are mentioned, but he was the most celebrated painter of his time. Pliny mentions a Venus by him, and a battle between the Egyptians and Persians on the Nile. He is known to have drawn in the locality of his battle. Nealces painted an ass drinking at the side of the river and a crocodile lying in wait for him, an ingenious application of accessories, of which there are also many other examples in the history of Greek painting. Nealces is one of the painters whose tradition represents as having succeeded by accident in painting the form on a horse's mouth with his sponge. Aratus, in his poem against the tyrants, waged war even against pictures, and resolved to destroy all their portraits which were preserved at Sicyon. This he did with one exception; Nealces saved the portrait of Aratrus by Melian. This was said to have been painted by a certain Polually. Aratrus was represented standing by a chariot of Victory; Nealces painted out the figure of Aratrus, and substituted a palm-tree in its place. 'The piece was so admirable,' says Pliny, 'that Aratus could not feel the art that was displayed in it; but his hatred of tyrants soon overruled that feeling, and he ordered it to be defaced. Nealces the painter, who was honoured with his friendship, is said to have implored him with tears to spare that piece; and when he found him inflexible, said, 'Aratus, continue your struggle with tyrants; but do not destroy Nealces.' Aratus gave his consent, and his old masterpiece still remains. But Aratus, but did not venture to put anything in its place except a palm-tree, and however that there was still a dim appearance of the feet of Aratrus at the bottom of the chariot. (Longhorn's Transl.) Such a claim of fame and of the barest shadow thereof, has been spoken of may have arisen sometime after Nealces altered the picture; such accidents frequently happen in painting out, unless a considerable body of colour is used.

Naxandra, the father of Naxos, was by Neaces, who was distinguished for her paintings; and his colour-grinder, Erginons, became a painter, and acquired great honour through the celebrity of his pupil Pasias.

(Pliny, Hist. Nat., xxxi. 11, 40; Plutarch, Aratus, 13.)

NEBULAE. [Star, P. C., pp. 449, 450.]

NECTANDRA, a genus of plants belonging to the native order Lauraceae. It has a 6-parted rotate calyx, deciduous segments, the three outer rays of which are 9 anthers which are ovate, nearly sessile, with 4 cells, arranged in a curve, and distinct from the tip of the anther, the cells of the interior anthers inverted. The glands are in the axils of the anthers, the back of the other segments next their back. The fruit is succulent, more or less immersed in the tube of the calyx, which is changed into a truncated cup. The flowers are panicled or corymbose, axillary lax and pretty amorphous.

N. cymbammus is a tree nearly 100 feet high, growing in the woods of the Orinoco, near S. Fernando de Atabasco, where it is called Sanafras, and also in the ancient forests of the Rio Negro in Brazil. The branches are smooth, the leaves oblong, lanceolate, papery, and shining above. The cup is large with a double edge. The bark aromatic, bitter, and stomachic. Martius suspects that it is one of the ingredients in the famous Wooroy poison of Guiana.

N. Cinnamomoides has oblong leaves tapering into a fine point, acute at the base, between papery and leathery, naked, smooth, and shining above. The bark is finely downy beneath, with numerous distinct narrow costal veins. The bark has the smell and flavour of cinnamon, as which it is used in New Granada.

N. Puchary major has oblong or elliptical leaves tapering into a narrow point, smooth, reticulated, and of the same colour on other side. The cup of the fruit is very large and spongy. Martius assigned the Pichary bean to this plant. In the early months of the year the fruit drops from their cups to the ground, and are collected by the natives, cleaned and dried by a gentle heat. They are prescribed in dysentery, diarrhoea, cardialgia, strangury, &c. The bark has the smell of fennel mixed with the smell of the fruit. (Linsey's Flora Medicinal.)

NECTARINE. [Amygdalas, P. C.; Peach, P. C.]

NECTARY, in Botany, a term used by Linneus to designate those appendages of the corolla which secrete honey. The term has however been used in a general sense to express any organ existing in the flower between the corolla and pistil, and which could not be rightly assigned to these or the stamens. Such parts or appendages of the flower have had many other names applied to them, and some much more commonly than nectary. A common form of appendage of the corolla is called corona. This organ is formed at the base of the limb of the corolla, and forms sometimes an undivided cup, as in the Narcissus, and when it is called by Haller a capybus. When it is separated into several parts, as in Silene and Brodiaee, it forms the lamina of some writers. In Stapelia this organ forms a thick solid mass, covering the honey of the stamens. It is here called the orbiculus. When this appendage is accompanied with little projecting processes, they are usually called the anthers. *

* These are not the words of Plutarch; he says the feet were under the chariot, and as they say ' ' , when the figure was painted out. The usual meaning of ' ' is ' ' , ' the whole earth was standing by it. The old version of Aratus is right. That of North, who translated Aratus, is partly wrong.
are called corona, or horns; the upper end of these is the beak or rostrum, and their back, if dilated and compressed, is called the caruncle. Occasional horns are a second set of horns, which alternate with the first, and are called ciliula; the circular space at the top of the orbicularis is the scutum. When the lamellae are small and scale-like, and overarch the orifice, they are called a frill. Link proposes to call all appendages which are referable to the corolla paracorolla, or, if they consist of several pieces, parapetaloids, and all appendages referable to the stamens parastamens. The peculiar filiform appendages of Passiflora he calls paraphyses or paraphractes.

The real nature of these appendages is a point of some importance. In some instances they appear to be simple expansions of the cellular tissue and epidermis of the part on which they are seated, and in others they are evidently abortive stamens or petals. Thus the little bodies found in the claw of the petals of Ranunculus may be regarded as an expansion of the tissue, whilst the filamentary appendages seen in the genus Passiflora are evidently metamorphosed petals. The various forms of corona may be assigned to one or other of the above causes. This subject requires investigation, and it would be well if a more simple and intelligible nomenclature could be applied to these parts of the flower; for, however unimportant at first sight such organs may appear, they neverthless contain some of the most vital parts of the plant, for species, genera, and even orders, which the botanist possesses.

The original name, nectaris, of these appendages was applied on account of the honey which the tissues of these organs frequently secrete. They were on this account called by Meyen compound glands. It was supposed by Kurr that the auxiliary glands were inculcated, and that the included secreted honey till the fruit began to develop itself. But that the function of the nectary has no direct relation with the object of the function of the fruit, that is, the development of the seed, is proved in an experiment by Kurr himself, in which he found that the seeds of plants become perfectly matured, although he had in the early stages of the growth of the flower removed the nectaris. As to what may be the destination of the nectar and the secretion in these flowers, any more than in other parts, no examination of their structure has hitherto pointed out. They do not however possess the power of secreting sugar and other secretions in any greater degree than the petals and other parts of the flower and fruit.

(Lindley, Introduction to Botany; Schleiden, Grundzüge der Wissenschaftlichen Botanik; Meyen, Pflanzen Physiologie.)

NEEDLE-ORE. [Minerology, P. C. S.]

NEGOTIABILITY. [Bill of Exchange, P. C. N.]

NELLIBUMI. [Arabia, F. C. and P. C. S.]

NELIUM, genus of plants belonging to the natural order Nymphaceae. It has many distinct carpal, half immersed in the profoundly honey-combed, obconical, elevated tube, and with a solitary flower in each capsule, which is exarillate, and destitute of albumen. The flowers are large and showy, white, red, or yellow. Both leaves and flowers rise from the surface of the water.

N. speciosa, Pythogorean Bean, has a polypetalous corolla and anthers drawn out beyond the cells into a club-shaped appendage. It is native in slow running streams and tranquil waters, in the warmer parts of Asia. The flowers are very beautiful, small, shining, and generally of a light colour, seldom white. A variety of this species, Tamarua, has its outer stamens sterile, dilated at the top, winged, obcordate, the appendage rising from a notch at the apex. It is native of Malabar. The fruit resembles an instrument once used in play by the French, called Lotus, and is one of the plants supposed to be the celebrated Lotus of antiquity, formerly found in Egypt. It was known to the Grecians, and is mentioned as growing in Egypt by Herodotus (f. 92), Theophrastus, and others. Although now not to be met with in that country, there can be no doubt as to its having actually existed there, either naturally or in a cultivated state, for these authors speak of it in clear and definite terms, and it should have been noticed that the seeds were still preserved, which testify that this species, as the proper Lotus, has obtained religious reverence. It is spoken of as having been used as food by the Egyptians. Both roots and seeds are consumed, and the latter are eaten in a raw state, or roasted, and to be of service in extreme thirst, diarrhoea, vomiting, &c. In China it is called Lienshua, and the seeds and slivers of the hairy root, with the kernels of apricots and walnuts, and alternate layers of ice, were frequently presented to the Emperor and his suite by the principal mandarins. The roots are laid up by the Chinese in salt and vinegar for winter use. Thunberg says this plant is held sacred in Japan, and is considered pleasing to the gods, "the doors of which are in reality the large leaves. The seeds are somewhat of the size and form of an acorn, and of a taste more delicate than that of almonds.

N. lutea has a polypetalous corolla, and greatly resembles N. speciosa in structure. It is native of North America, in lakes and ponds: it has been naturalized as far as Philadelphia. The flowers are yellow, and resemble a double tulip. The seeds are very agreeable to eat, and are much relished by the Indians.

The species of this beautiful aquatic genus should be grown in cisterns, tubs, or large pots, in a rich loamy soil; they require a strong heat to flower to perfection. The pot they are in should be kept full of water while they are growing, but may be allowed to get dry when the flowering season is over. They may be increased by dividing the roots, but are obtained more readily from seeds, which vegetate freely. None of the species have flowered in this country excepting the N. speciosa; they all require a very warm situation in a stove.

Do: Gardener's Dictionary; Burnett, Outlines of Botany.

NEMACANTHUS, a genus of fossil fishes from the colite and liassic strata. (Agassiz.)

NEMASTYLIS, a genus of fossil Annelida, from the lower silurian strata of Lampeter, in South Wales. (Murchison.)

NEMOCERIA, the first family of Dipterous insects in the arizmogynous, and that inclosed in the antennae composed of many joints, an exserted head, a sheathed sucker, and either simple or toothed tarsal hooks. It includes the species of Culex and Aedes, the names given by naturalists to the Mosquitoes and Gnats. These Linnean genera are now greatly subdivided.

NEOTTTIA (serrata, 'a nest with the young in it,' the young themselves), a genus of plants belonging to the natural order Orchidaceae, having the stamens arranged in a long stamen, 2-lobed lip saccate at the base; the stigma transverse; rostellum flat, broad, prominent, entire, and without an appendage.

N. Nithia-aria, bird's nest orchis, is the only British species of this genus. The whole plant is of a pale reddish-brown; the root formed of many thick fleshy fibres, from the extremities of which young plants are produced. The stem is about a foot high, with spreading brown scales. It has no leaves. The spikes are dense, cylindrical, and many-flowered. It is the original Neottia of Linnaeus, and is native of Great Britain and Ireland. (Albington's Manual of British Botany.)

NEPA, a genus of hemipterous insects of the family Hydromeris, the species of which are popularly known as water-contrpions. Their bodies terminate in two long sets, by means of which they acquire a supply of air for respiration, when immersed in the water or mud.

NEPETEA, (a name used by Pliny from Nepes, scorpion, being supposed to be efficacious against the bite of a scorpion; or from Nepes or Nepete, a town in Tuscania,) a genus of plants belonging to the natural order Labiatae, and the tribe Nepetae. It has diverging anther cells, a ringin corolla, the upper lip flat, straight, emarginate, or bifid. The calyx is 5-toothed.

N. Cataria, catmint, has stalked corolate acute leaves, deeply crenated and clothed with a whitish pubescence beneath, the many-flowered white, smooth and glabrous leaf. The stem is from 2 to 3 feet in height, downy or mealy. It is native throughout the whole of Europe and middle Asia, and is plentiful in Britain. The corollas are white, with a tinge of red spotted with purple. The whole plant has a strong smell between mint and pennycroyal. Cats are said to be fond of it, and hence it derives its name; they roll themselves on it and tear it to pieces apparently with much pleasure. Ray noticed that the whole plant was eaten by the cattle, but after the garden were always destroyed by cats, unless he protected them with thorns until they had come into flower; but they never meddled with plants raised from seed, and hence the old saying, 'If cats don't eat the cats will eat it, if cats eat it, cats won't know it.' Ray accounts for this from the fact that by transplanting the leaves become bruised, and the powerful odour is exhaled which attracts the cats to it. It appears to
act as a real aphidaphage upon cattle. Sheep are said to eat it, but do not seem to do so freely in a moist state. All other domes require a good deal of heat to flower well in this country.

(Don, Gardener's Dictionary; Lindley, Flora Medica; Burnett, Outlines of Botany.)

**NER**. Website not found.

**NEUTRIA.** [Cottou, P. C.; Fournier, F. C. S.]

**NEWCASTLE, Duke and Duchess of.** [Cayvendish, Margaret, P. C. S.]

**NEWGATE, Duke of.** [Dance, P. C. S.]

**NEWTON, GILBERT STUART, R. A.,** was born in 1794, at Halifax, in Nova Scotia, where his father was collector of the customs. He came to England about 1820, and, after making a tour in Italy, he entered the Royal Academy. He adopted Watteau in some degree as his model, and produced several excellent small pictures much in the style of that master as regards the figures, yet at the same time displaying great expression and character. His first works which attracted notice were the Farsaken, and the Lover's Quarrel, engraved in the 'Literary Souvenir' of 1826. He painted the Prince of Spain's Visit to Catalonia, for the Duke of Bedford for 500 guineas; it was engraved in the 'Literary Souvenir' for 1831. In 1830 he painted Shylock and Jessica, from the 'Merchant of Venice'; Yorkic and the Grisette, from the 'Sentimental Journey,' and the Abbot Boniface from the 'Monastery:' all in the edition of 1834 printed in 1830. In 1831 he exhibited Portia and Bassanio, another scene from 'The Merchant of Venice;' and Lear attended by Cordelia and the Physician. In 1832 he paid a visit to America, and painted those scenes in which he was elected an academician, he exhibited a small picture of Abelard sitting in his study, a work full of expression and sentiment, and his day in the life of Wakefield restoring his daughter to her mother, Machethe, and a few portraits. His Masque was purchased by the Marquis of Lansdowne for 500 guineas.

His Abelard was the last picture that he exhibited in the Royal Academy, 1835, and it was about this time that he evinced signs of aberration of mind, and these were followed by unaccountable insanity, which however he recovered from four days before his death, and breathed with calmness and resignation August 5, 1835, at Chelsea, aged forty. His will returned with her child to America a few months before his death. He painted slowly, and was laborious and fastidious in his execution. He was also, says a friend, extremely neat and fastidious about his dress, though 'he was far from paying the same attention to his chambers, for his compositions were scattered carelessly around; the finished and unfinished were huddled together, and ivycoke models and bits of ribbon and withered flowers abounded.' This was in 41, Great Marlborough-street, where his principal works were painted.

**Gentleman's Magazine.**

**NEY, MICHAEL,** 1st Duke of the Moskova, Duke of Eichingen, and Marshal of France, was born at Sarre-Louis in Lorraine, on 10th January, 1769. At the age of thirteen he was articled to a notary of that town, but this occupation not being suited to his disposition, he got himself made a captain in 1787 in the regiment of dragoons of the Meurthe. He there soon distinguished himself by his courage and activity, and, after passing through the inferior grades, he became a lieutenant in 1793, and a captain the year following. The skill which he displayed in conducting some partisan warfare in 1794 attracted the attention of General Kleber, by whom he was sirnamed 'The Indeffatigable,' and raised to the rank of adjudant-general. In 1796 he greatly contributed to the victory obtained at Neuwied, and distinguished himself in the engagements of Altenkirchen [Lavenere, P. C. S.], Montaub, and Dierdorf, in which last he made a prisoner. After his exchange he served in 1798 with the army of the Rhine, and after the death of the Duke of Malspal the small body of cavalry he took two thousand prisoners, and obtained possession of that town, he was nominated general of brigade. In the course of this campaign his courage was confirmed by his successful assault of the French barracks, which had been taken prisoners, and he enabled them to clude the sanguinary decrees of the Directory. In 1799 he again served with the expedition against Genoa under General Moreau. We can only enumerate the principal achievements which in this memorable campaign added to his celebrity. They are the capture by surprise of Mannheim (12th March, 1799), the taking of the redoubt at Ratis, and the seizure of all the enemy's artillery at the battle of Iler (5th June, 1800). He was also present at the battle of Hohenlinden [Morkon, P. C. S.], and his bold attack of
column of the Austrians, which he drove back into the forest, greatly contributed to the victory. At the peace of Lunéville he returned to Paris, where he was received with distinction by Bonaparte, who attempted to attach him to his interests, caused him to marry Mademoiselle Auguié, a friend of Hortense Beauharnais. In 1803 he was appointed minister plenipotentiary of the French Republic in Switzerland; on leaving that country, as he was particularly interested in the neutralization of many of their esteeem for his character and conduct, and the moderation with which he carried into effect the measures of his government. On his return to Paris the command of a division was conferred on him, and on 7th December 1804 he was made a Marshal of France by Bonaparte, and in 1804 he was raised to the dignity of a Marshal.

On the renewal of hostilities with Germany in 1805 the direction of the eighth corps of the army was confided to Marshal Ney. A brilliant achievement in this campaign, the capture by storm of the village of Echelignes (October 6th, 1805), in which the Russians, under General Lefson, lost fifteen hundred men killed and wounded and two thousand taken prisoners, was attended with the most important results. The impetuous courage and persevering skill which this marshal displayed on that occasion had been witnessed by Napoleon, who in commemoration of it afterwards bestowed upon him the rank and title of Duke of Echelignes.

But it was perhaps during the Prussian campaign of 1806 that Ney's military reputation rose to its greatest height. Of the three victories by which he distinguished himself the chief are, the capitulation of the towns of Erfurt (October 15th, 1806) and Magdeburg (November 11th, 1806) in which 23,000 prisoners were taken and 800 pieces of cannon fell into his hands. In the passage of the Taunus, the total destruction of a Prussian corps at Deppen (February 6th, 1807), the combat of Schomditten, by which the retreat of the Russians on Königscburg was cut off, and, finally, the defeat of the left wing of the enemy at the battle of Friedland (Bonaparte P.C.), which more than any other movement contributed to the victory. In September, 1808, he was appointed to command the army in Spain, and his distinguished services in the various engagements by which Galicia and the Asturias were subdued. In Portugal, though under the orders of Marshal Masséna, the merit of the capture of Ciudad-Rodrigo (July 10th, 1810) and of Almeida (August 27th, 1810) have generally been attributed to him. He was also of great assistance to Masséna in conducting his skilful retreat, after his failure in attempting to force the lines of Torres Vedras. (Masséna, P.C.S.)

The different dispositions however of these two great generals soon brought on differences of opinion, which ended in a serious dispute. The result was unfavourable to Ney, who was deprived by Napoleon of his command and recalled to France.

1813 found him engaged on the disastrous expedition to Russia, and had the command of the third corps of the grand army. In the course of it he appears to have freely expressed to Napoleon his dissatisfaction at some of his movements, and advised him to settle these matters. At the beginning of this year (August 17th, 1812), at the battle of Valentinia (August 19th), and, above all, at the sanguinary battle of the Moskva (September 14th), from which he derived the title of Prince of the Moskva, he eminently proved himself worthy of the surname by which he was known to the army, of 'Bravest of the Brave.'

But it was during the calamitous retreat of the French army that he rendered it the most important service. The details of it are amply described in the histories of Ségur, Chambray, and Labanne; the first of these, however, though one of the finest models of historical style, should be read in conjunction with the Memoirs of General Gourgaud, who, with military bluntness, and perhaps some personal hostility,corrects several erroneous statements of Ségur. One incident in this retreat is particularly characteristic of Ney's perseverance. General Dunns relates that as he was sitting down to breakfast at Ganbinne, a man in a brown coat, long beard, and a weather-beaten countenance, entered his room, exacted a passport, and said: 'Can you recognize me?' The general having answered that he did not; 'I am the rear-guard of the grand army,' he continued; 'I have fired the last musket-shot on the bridge of Kowno; I have thrown over the two lines of the Nereides, and I am now here through the woods. I am Marshal Ney.' (Colonel Mitchell's 'Fall of Napoleon,' vol. ii.)

In the campaign of 1815 Ney displayed his usual courage and perseverance. The following extract from the memoirs of one of his subordinates, Camp de Lützen, Lützen, and Dresden. He met however with some severe reverses, and at the battle of Dannewitz (September 6th, 1813) he was signally defeated by the Prussians and Swedes under Bernadotte, then Crown Prince of Sweden [The battle of Dannewitz was fought on September 6, 1813, in which the French were decisively defeated by the combined forces of the Russian, Austrian, and Saxon armies under the leadership of Prince Frederick Charles of Hanover, the Crown Prince of Sweden. This defeat marked a significant turning point in the Napoleonic Wars.], and a considerable number of his troops, about four thousand men, forty-three pieces of cannon, and three standards. After this disastrous engagement Napoleon had an interview with Ney's aide-de-camp, whom he interrogated respecting the conduct of the battle, and particularly in regard to the placing of his men. The latter attributed the failure to it to the generals present, without giving expression to any feeling of dissatisfaction at the conduct of his lieutenant. The Emperor," says St.-Cyr, who is quoted by Alison (Hist. Europe, vol. vii. p. 444), "explained satisfactorily the causes of the reverse, but without the slightest expression of ill-humour, or any manifestation of displeasure at Ney or any of the generals engaged. He ascribed the whole to the difficulties of the art of war, which he said were far from being generally known. He added that, one day or other, if he had time, he would write a book in which he would demonstrate his principles in a manner so precise they should be within the reach of all men, and enable them to learn the art of war as they learn any other science.'

After the abdication of Napoleon, in 1814, Ney withdrew from public life and retired to his chateau in Lorraine. It was there that, on the 6th of March, 1816, he received orders from the Minister of War to join the eighth military division, of which he was commander, and which was stationed at Basle. He immediately proceeded to Paris, where for the first time he learned the return of Napoleon from Elba. He then willingly undertook the duty which had been imposed upon him to lend his aid to the restoration of his master; and on taking leave of Louis XVIII., he assured him that he would bring back Bonaparte in an iron cage. As some doubts have been cast upon the truth of this boastful assertion of Ney, it may be well to state that he himself acknowledged on his trial that he used the expression. On leaving the king he travelled rapidly to Aixerre, where he alighted at the residence of his brother-in-law, the prefect of the department, who had zealously espoused the cause of the restored Napoleon. Ney acquainted with all the difficulties likely to attend any support of the Bourbon dynasty, and his own doubts on this subject increased as, advancing towards Lyon, he became more aware of the popular feeling in that part of France. The character of Ney was more fitted for the field of battle than for a political struggle, and it was only in the presence of danger that he showed resolution. Of this Napoleon was well aware, and he skilfully threw the weight of his influence and entreaties into the balance of Ney's already vacillating opinions. An earnest appeal to the early and glorious reminiscences of the prosperous days of the Empire, coming from his ancient chief, the creator of his fortune, and completely overawing him, was the result of this marshal. 'In the night of the 13th of March,' said he at his trial, 'down to which time I solemnly declare my fidelity, I received a proclamation drawn by Napoleon, which I signed. On the 15th of March, I was on my way to the troops, who received it with the most enthusiastic approbation.' His defection was speedily followed by that of his whole staff. On the 10th of June he joined the army at Lille, and was soon actively but unsuccessfully engaged with the British at Quatre-Bras. His conduct at Waterloo elicited equal praise both from friend and foe. His fruitless but resolute attempts at the head of the columns of the guard to overwhelm the British before they could receive succour from the Prussians, are well known. Five horses were shot under him in this terrible conflict; still, on foot, his clothes pierced with balls, he gallantly headed the impetuous charge. In the disastrous retreat which ensued, he was among the last to leave the field, and, as on the plains of Russia, he was the rear-guard of the last Imperial troops. After the defeat of Napoleon at Waterloo, Ney returned to Paris, and remained there after the capitulation of that city to the allies, considering himself safe by virtue of the twelfth article of the Convention. His advice was promptly rejected. The clause: 'All the individuals who are at present in the capital, shall continue to enjoy their rights and liberties, without being disquieted or prosecuted in any respect, in regard to the functions they have discharged, or have contributed to the political conduct or opinions.' (Convention, 7th July, 1815.)

On the 24th of July however appeared a Royal ordinance, in which, among several others, he found himself proscribed as a traitor. He had gained by obtaining the victories of Bautzen, Lützen, and Dresden; he met however
the château of Bessons near Aurillac. He was at first convicted before a council of war, which declared its incompetency to sit in judgment on a peer of France. His trial was then removed to the Chamber of Peers by another Royal ordinance of 29th July. His defence was most ably conducted by his eloquent advocates, Berryer and Dupin, and chiefly rested on the article of the capitulation above alluded to. The result however was that he was found guilty, and condemned to death. When the sentence was pronounced, Berryer ex- ployed Michael Ney, now a French soldier, and soon about to be a heap of dust.' A spot in the garden of the Luxembourg was selected for the execution; he met his fate at eight o'clock in the morning with calm courage. 'He who had fought five hundred battles for France—not one against her— was shot as a traitor.' (Napier, Hist. of the Peninsular War, vol. ii. pp. 406.)

The reflections of Alison on this event are creditable alike to his impartiality as an historian and his feelings as a man. 'The death of Ney,' he says, 'is a subject which the English historian cannot discuss without painful feelings. His guilt was so great; his past conduct so damnable; and his death inflicted upon one for a political offence who more richly deserved his fate. The question of difficulty is, whether or not he was protected by the capitulation of Paris. The clauses in that instrument clearly declared that no person should be molested for his political opinions or conduct during the Hundred Days; and it is very difficult to see how this clause was in any way to apply to a man who was within the city at the time of the treaty. Wellington and Büchler concluded the capitulation: their Sovereigns ratified it: Louis XVIII. took benefit from it. How then can it be said that he, as the allied sovereigns, were not bound by the treaty, especially in so vital and irreparable a matter as human life—and that the life of such a man as Marshal Ney? It is very true a great example was required; true, Ney's treason was beyond that of a man; true, the Revolutionists required to be shown that government could punish; but all that will not justify the breach of a capitulation. To say that Louis XVIII. was not bound by the capitulation; that it was made by the English general without his authority; and that no foreign officer could tie up the hands of an independent sovereign, is a quibble unworthy of a generous mind, and which it is the duty of the historian invariably to condemn. This was what Nelson said at Naples, and what Schwanzen- burg said at Dresden; and subsequent times have unanimously condemned the violation of these two capitulations. Banished from France, with his double treason afloat to his forehead, Ney, the great favourite of the Egyptian tide, felt as much as the world his guilt will be forgotten in the tragic interest and noble heroism of his death.' (Hist. of Europe, vol. x. p. 97)—

(For the following works we must consult for a full detail of the life of Marshal Ney: Vie du Maréchal Ney, avec Hist. de son Procès, Paris, 1816; Biog. des Généraux Français, par Courcelles; Hist. de Napoléon et de la Grande Armée, par Segur; Hist. de l'Expedition de Russie, par Chambray; Alison, Hist. de l'Europe, vols. iii. iv. v. vi. x.; Court and Camp of Napoleon; Mémoires de Rapp; Napier, Hist. of the Peninsular War; Mitchell, Fall of Napoléon; Examen critique de l'Hist. de Séguir, par le Gén. Gourgaud. The arguments in favour of his condemnation may be seen in the works of Bellart, the crown prosecutor, Affaire du Maréchal Ney."

RIBELIEN LIED. [GERMANY, P. C., p. 194.]

NICERON, JEAN-PIERRE, was born at Paris in 1685. He entered the regular order of Barnabites, and de- voted himself to the study of languages and biography. He led a life without incident, and died at Paris on the 8th July 1738. He is chiefly known as the author—or in some parts rather the compiler—of Mémories pour servir à l'Histoire des Hommes Illustres dans la République des Lettres, of which thirty-nine volumes were published by Niceron, and four were added after his death. All who have had occasion to study the earlier literary history of France must be under obligations to the worthies of which Niceron's Mémories are never very high in criticism, philosophy, or the essential elements of spirited and descriptive biography. Niceron was however a curious and laborious reader, and in those instances where he exhibits the fruit of his own original re-

search, his matter is highly valuable. Many of the lives however are mere compilations from other sources, and appear to have been hastily prepared to suit the order of publication. There is little attempt at a proportional distribution of space, seldom is a writer treated with any grace or consideration, and he stands out as elaborate as the most distinguished men of their age. This is a defect sometimes not unpleasing, as it generally att-
for it reconciles all the facts recorded of Nicias, and it is much more probable that Praxiteles would employ a young man to colorize and give him his passion, than a great painter, his equal in age and reputation. Statue-painters, *χρώματος χρωστοί*, constituted apparently a class of themselves, and Nicias may have been one of these in his youth. It is more probable that one of his greatest painters of his time should be thus employed. One of Sill's difficulties in identifying these two as one, is, that Nicias was the pupil of the pupil of Empourhor, who was the contemporary of the great painter. It is true, however, to suppose that there must necessarily be a generation between master and pupil: the master is frequently only a very few years older than his pupil, and is sometimes even younger. If we suppose that Empourhor was a generation younger than Praxiteles, there is not the slightest difficulty in the way of his having been the pupil of the pupil of a contemporary of Praxiteles.

Nicias painted in encaustic, and besides the one already mentioned Pliny notices the following pictures by him:—an Alexander (Paris), a sitting Calypso, an Io, an Andromeda, and another Calypso, in the hall of Pompey; a Bacchus, a Diana, and a Hyacinthus, in the temple of Concord. The Hyacinthus was brought to Rome by Augustus from Alexandria, and was consecrated afterwards by Tiberius in the temple of Augustus, on account of his great delight in it: it is mentioned by the Roman authors (III. 19), who says that the figure of Hyacinthus was very elegant. Augustus dedicated and fixed in the wall also a picture by Nicias in the Curia Julia, of Nemos sitting on a lion, holding in his left hand a serpent, which was fastened to his gown by a small bow; that was the picture of an old man, resting upon his staff; above him was hanging a picture of a Biga. It was brought from Asia by Silanus, and was most probably the same of which a Teutons was ambiguously being asked his opinion, said, according to Pliny, 'That he would not have him even if he were real and living,' alluding to the old man with his staff: entirely overlooking the art which embellished the picture, and measuring the man apparently by his sinew. Leucippus (Lacocon, p. 380, note) proposes to substitute in the place of the picture of the Biga, (tabula biga) hanging above the man's head, which he supposes to be a corruption of the text, a name tablet, called by the Greeks *στυλίων*. Nicias wrote on this picture that he had burnt it in, *Nicis θεσσαλικος*, that it was painted in encaustic. These words were, in the opinion of Leucippus, written upon the small painted tablet which was hanging over the head of the old man—*cuio supra caput tabula biga dependit*. Nicias scriptum se insensi; tali enim uasis est verbo. The passage is obscure; only one picture is spoken of; the words *tabula biga* may be corrupt; it is certainly difficult to give them a suitable meaning. The Biga, says Leucippus, can have no respect to the Nemean games, because in them four-horse chariots were used. (Schmidius, in Pro. ad Nemeonicae, p. 2.)

The pictures of the interiors of houses of that of Merga-byzus, high priest of Ephesus, and one at Triaeum. Pausanias says, before you come to Triaeum from Phare there was a *σεπχυρε* of white marble, which was particularly worthy of inspection on account of the painting thereon. A beautiful young woman was represented seated on an ivory chair, and behind her was a female servant holding an umbrel; a beardless youth also was standing near her, dressed in purple; by the youth was an attendant with hunting spears and a leash of dogs (Nicias was, according to Pausanias, the most excellent animal painter of his time); the names of these people were not known: Pausanias supposed them to be man and wife. Nicias was honored with a public burial, and was interred in the road from Athens to the Academy, the cemetery of all great Athenians: Pausanias notices his tomb there. He appears to have been a very statesman. Athenae says he used to forget to take his meals (Var. Hist., iii. 31).

It has been said above that Nicias painted some of the statues of Praxiteles: this requires some explanation. Pliny relates that Praxiteles being asked which of his marble statues he preferred, answered, 'those which Nicias had had in hand; so much did he attribute to his color.' As this word *circumlitos* has been variously interpreted: Fuuci supposed it signified the outlining of the clay model; but Pliny is speaking of marble statues, and the circumlitos must have been some superficial applications. If this be applied to a color question is also about a process which the marble statues have undergone at the hands of a painter. Cicero has 'Persae

mortonis eura circumlitos condunt.' (In Tusc., i. 45.) There is a prejudice against the idea that the Greeks painted their marble statues; but to some extent this is true, in fact, though it was not a universal practice. The statue-painters, of *χρωστοί* or *χρώματος χρωστοί*, as Plato calls them, are definitely spoken of by Plutarch (De Glor. Athen., 6), as *χρωστοί*, or *χρωστοί*, as *χρωστοί*. Statues seem to have been sometimes entirely painted, which appears from the following words of Plato (De Republ., iv. 420. c.). He observes, in speaking of the dispute about the statue painting, 'Every one of them assumes that the color shall be accorded to any particular part, but by giving every part its local colour, that the whole is made beautiful.' That it was not however the common practice to paint the marble entirely in color is evident from the correspondence between Lycurgus and Aristar tus, in the dialogue of the Portrait, or Pauhena, in Locius; from which it is plain the Venus of Cnidus, by Praxiteles, and other celebrated statues, were not painted, though parts may have been coloured, and the whole body covered with an encaustic varnish. (Locius, Imag., 5-8.)

We may infer therefore in this case that the *circumlitos* of Nicias, applied to the marble statues of Praxiteles, was the *χρωστοί* of Plutarch, and that Nicias was himself an *ακρωτήριον χρωστοί*, or painter of statues, in his youth. In his *circumlitos* the naked form was probably merely varnished, the colouring being applied only to the eyes, eye-brows and other noticeable parts, to increase the effect of the draperies, and to give a more finished effect to the whole; and there can be little doubt that marble statues, especially of females, must have had a very beautiful appearance when carefully coloured in this way. (See his *Roman Antiquities*, Art Painting, by the author of this article; Pliny, Hist. Nat., xiv., 10, 36-40; Pausanias, i. 29, iii. 17, vi. 22; Plutarch, More, 11; Junius, Catalogue Artificum.)

NICOLE, PIERRE, one of the distinguished painters of Port Royal, was born at Chartres on the 19th of October, 1625. At the age of fourteen, when he is said to have had an ample command over Greek and Latin, he was sent to study at Paris, where he was persuaded to join the community of the Port Royal. There he occupied himself in instructing the pupils confided to the institution. He formed an intimate acquaintance and a species of alliance with Anthony Arnauld, with whom his zeal and restless energy his placid disposition and clear systematic mind afforded a strong contrast. (Amsbach, F. C.) The angry disputes regarding the five points of the Jansenists prompted him to remain for several years a simple clerk, but in 1676 he was induced to seek holy orders. He was refused the necessary consent however of the Bishop of Chartres, who disliked his opinions; and he was evidently rather rejoiced than saddened by an excuse for remaining in a position where he was not too near the van in the battle of controversy. In his own province, however, of a clerical or polemical logician, he was bold and uncompromising, and was regarded by the Jansenists as too conspicuous a championship that he shrunk. He was obliged in 1679 to retire from France, but returning soon afterwards, he entered with some keenness into two of the most celebrated disputes of the age. He went to the monastic institutions, where he joined Mabillon in defending a devotion to science and learning in place of pure asceticism; and the discussion regarding quietism, in which he opposed the devotees of that mental epidemic. He was a man of simple habits and candid mind, and some ludicrous incidents have been told as arising out of his absent habits. He died on the 11th November, 1686. His works are many and voluminous. He was the principal author of 'La Logique, ou l'Art de penser' (1658), known as the Port Royal Logic. Of the first three volumes of 'La Perpétuité de la Foi de l'Eglise Catholique touchant l'Eucharistie,' which is generally associated with his name of Arnauld, he is known to have been the principal writer. Hume admired the logical clearness with which Nicole in this work showed the impossibility of one mind sufficiently examining all objects connected with religion to form a creed for itself on the principle of private judgment; and stated that the difficulty so ingeniously set forth suggested to him the sceptical argument in his Dialogue with a Naturalist. He wrote also 'Traité de l'Unité de l'Eglise'; 'Les Prétendus Réformés convaincus de Schisme'; 'Les Lettres imaginaires et visionnaires,' &c. He was eminent as a translator and composer in Latin, and in 1656 published a translation of Ibsen's 'Historie.'

(Niceron, Mémoires, t. xxiii. 285-333; Nouv. Dictionnaire Historique.)
Nigell, Robert, a poet distinguished by the precocity of his talents, was born at Tulybelfane, in Perthshire, on the 7th January, 1814. His parents were in too humble circumstances to afford him any education beyond the rudiments of reading and writing; and at a very early age he was set to the occupation of herding cattle. At the age of seven he was apprenticed to a grocer in Perth, and at the conclusion of his service endeavoured to earn a livelihood by keeping a circulating library. In the midst of this occupation he had been acquiring the elements of knowledge. He was a devourer of books, and at the age of twenty had acquired both knowledge and cultivation without being educated. In 1834 he published a collection of Poems, which became very popular, were extensively noticed by the newspaper press, and passed through three editions. They are less remarkable for energy or originality than the fruit of a fine-toned and sensitive mind. In prose his writing was of a different character. In 1836 he undertook the editorship of the 'Leeds Times,' a paper of strongly liberal sentiments; and by the energy and vigour of his political articles, and their association to the feelings of the surrounding community, he soon more than tripled the circulation of the paper. His early struggles had probably undermined his constitution, and he soon sank under the exactitude of his editorial labours. When on his death-bed he was removed to the neighbourhood of Edinburgh, where, amidst the attentions of kind friends, he died on the 9th of December, 1837, in his twenty-sixth year. 

(Memoir, by Mrs. Johnstone, prefixed to a third edition of his Poems; Westminster Review, No. 76.)

Nicomachus (Nicasouydis) of Thessalonica, son and pupil of Apelles of Alexandria, flourished between 360 and 300 B.C. He is classed by Cicero with Apelles and Protagenes, and his paintings are compared by Plutarch with the lines of Homer: he was the most celebrated of all the Greek painters for rapidity of execution. In illustration of the rapidity of his execution, Pliny mentions the decorations of the monument which Aristratus, tyrant of Sicyon, had erected in honour of the poet Telestes, which were executed in a few days. In one of his works, which was reserved for the beauty of the whole, to the entire satisfaction of Aristratus, who shortly before was exceedingly angry with him, for, as he supposed, neglecting his contract, which was to have the tomb finished by a certain day. Nicomachus had deferred the commencement of the tomb so long, that Aristratus concluded he did not intend to meet his engagement; the painter, however, was a better judge of the required time in his own case. The notices of Nicomachus are few, and what there are contain but little information about him. Pliny mentions by him—A R ape of Proserpine in the Temple of Minerva on the Capitol, hanging above the niche or shrine of Juno or your. In the description, the face is fresh which is dedicated by Pianus: also Apollo and Diana: a Cybele, the mother of the gods, sitting upon a Lion; Bécantes, with St. John breathing up to them; and a Scylla, which was in the Temple of Apollo on the Tiber, and is now seen in the painting of the Tyndarides by Nicomachus; he instances it as an example of the unfinished works of painters being in greater request than well-executed works, which left unfinished through death, or perhaps other circumstances impeding their completion: he mentions four pictures—the Tyndarides of Nicomachus, the Iris of Ariadne, the Medea of Timotheus, and a Venus of Apelles. Nicomachus is the first who represented Ulysses with the pike or cap of liberty. He is one of the painters from whom an error of Pliny's is said to have used only four colours. (See Dictionary of Greek and Roman Art, by Percival, p. 147.)

N. sativa has ovate obtuse anthers, capsules muriarated, united to the very point into an ovate fruit, terminated by five erect styles; the stem erect and rather hairy; flowers naked. The seeds are eaten in the same way as the former are used instead of pepper; and have also been employed as carminatives. It is the Melandrium of Hippocrates. 

Steril. 675, and of Dioscorides, 3, 93; the Gibex of Pliny, 20, 17.

N. aromatica has pointed anthers; from 5 to 7 styles ciliate, involute, downward smooth; capsules connected below the middle into an obconical fruit, which is narrowest at the base. It has a smooth stem, with diverging branches. It is native of middle and southern Europe in corn-fields, also in the north of Africa. The seeds are sometimes used instead of those of N. sativa, but they are not so aromatic, neither have they so pleasant a smell. Both species are employed in the adulteration of pepper. All the species of Nicella are plants of easy culture, only requiring to be sown in the open border. They are hardy and annual plants.

(Don, Gardeners's Dictionary: Lindley, Flora Medica; Frass, Synopsis Plantarum; Flora Classic.)

NIGRIATA is a term, which was formerly applied by geographers to the black African, and was derived from the name of Sooan of which Arabic expression it is only a translation, meaning the country of the blacks. (Sooan, P. C., vol. xii.)

NILE. Since the article Nile was printed in the P.C. the course of the western branch of the river, the Baher-el-Abiad, has been traced to 4° 42' N. lat., which is nearly nine degrees south of Aleis, to which place it had been explored by Linnant. It ascends in the year 1840, 1841, 1842, 1843, and in the year 1845, the pasha of Alexandria made preparations for the purpose of exploring the course of the river to its source, and the two last expeditions were accompanied by several scientific Europeans. South of Khartoum (15° 17' N. lat.) and as far south as Aleis the Baher-el-Abiad is in general from one to two miles wide, and runs in a bottom, which is generally four miles wide, but sometimes even six miles. The bottom is covered with grass and the higher grounds at the back are partly covered with trees. There occur a few low hills in this part of the country. The western banks of the river are occupied by the Husunnyé, a nomadic tribe of Arabin origin, the most southern of this division is a Vataya, which closes the west side of the river, and are frequently several miles long and a quarter of a mile wide, and nearly all of them overgrown with high trees and bushes. On the western side is a mountain group, called Arassali, which is crowned with seven peaks; between this high ground and the banks of the river are extensive forests. In these forests are numerous villages, which when seen from the river appear to be regularly arranged in three rows parallel to the river. They are inhabited by the Shillucks, a paitical nation of blacks, who frequently descend with their boats in great numbers to the countries lower down the river, and formerly extended their incursions as far as Khartoum, where at present they are kept in awe by the pasha of Egypt. Near the southern limits of their territories the country is interspersed with numerous isolated conical hills, among which one called Déva Fungh (10° 90' N. lat.) stands out, which itself rises from a flat volcanic cones, consisting partly of tuff and red-brown porous lava.

Near 9° 11' the Baher-el-Abiad is joined from the east by a large tributary, the Sobat, which is supposed to rise in the higher mountains of Abyssinia, and which is nearly equal to that of the principal river. The lower course of this tributary was explored, and it was found that it runs between banks, which are much higher than those of the Baher-el-Abiad, and as far as Khartoum, from the mouth of this river to Khartoum the Baher-el-Abiad flows from north to south, but higher up it runs from west to east for about a hundred miles, through a country inhabited by another black nation, the Dinkas, who are divided.
Into seven tribes and speak a language different from that of the Shillucks. In this part (between 8° and 9° N. lat.) the river appears to traverse an immense swamp interspersed with many smaller and larger lakes, one of which is stated to cover an area of 420 square miles. A broad, sluggish river runs through these low grounds is imperceptible, and its water divided into so many branches, that it is difficult to find out the main channel. It is supposed that the great quantity of water which runs through the different parts is brought by a river running from north-west to south-east, perhaps that river which by the Arabian geographers is called Kailisec. It is also possible that the course of this river has induced them to adopt the ostrich-skin for the reasons of clothing, which they wear, and in this part. The Nuba inhabiting this swampy region are a nomadic tribe, who live principally on the produce of their herds of cattle, distinguished by large horns like those of ancient Egypt. They are less strongly built than their northern neighbours, the Shillucks, and it appears that their health suffers from their residence in the swamps. In this region the elephants, giraffes, and hippopotami are met with in great numbers.

Before the Bahr-el-Abiad enters this swampy region it runs from south to north, but farther upwards (south of 7° N. lat.) from south-east to north-west. The country traversed by it is a plain. They are completely navigable, without channels, and even without rapids. Its eastern banks are occupied by the Nuerres, and its western by the Kyks or Kekos. Both nations are cultivators of the ground, but have also numerous herds of cattle. They are not very numerous. The colour of their skin inclines to the red, and their hair is smooth and lank, not woolly. They have enclosures round their huts, and others for their cattle. The Kyks have also numerous wells for water, but live entirely on cattle and roots. Both nations received the expeditions with confidence and joy, and presented to them a great number of cattle. It appears that these tribes speak a language which is understood by the Dinkas.

Farther upwards other tribes are named, as the Helibah, Bhor, and Chir. At last the expeditions arrived in the country of a black nation called the Barrys, where their progress was stopped by the gibbons which inhabit the river banks at its width near 4° 42' N. lat. and 30° 58' E. in. Long. In approaching 5° the bed of the river, which up to these parts appears to be formed by alluvial soil, begins to be rocky, and at the same time mountains become visible, which extend from east to west. The river by degrees acquires such a velocity as to run six knots an hour. According to the information obtained from the aborigines, or king of the Barrys, persons must walk for a month before they arrive at a country called Anayas, where the river is formed by the confluence of four rivulets, the largest of which comes down from the east.

The Barrys are described as a very warlike nation. They can cook five things at once, and speak a peculiar language. Their country is well cultivated and exhibits the richest crops, their fields being irrigated by numerous canals. They enjoy a considerable degree of independence and are armed to the teeth. They are also acquainted with the art of tanning and making some cotton fabrics, and wearing copper and ivory, which they employ as ornaments. The king is said to live in a palace, built on an island, to which his subjects can only arrive by swimming. He is surrounded by a guard composed of women. It was observed by the persons who composed the expedition, that the inhabitants were in possession of several articles which are not to be found in India, or in the countries at the extremity of the East Indies, as several pieces of damask made at Surat, as also swords and other arms of iron. They are also acquainted with a system of wood and ivory, which they employ as ornaments. The king is said to live in a palace, built on an island, to which his subjects can only arrive by swimming. He is surrounded by a guard composed of women. It was observed by the persons who composed the expedition, that the inhabitants were in possession of several articles which are not to be found in India, or in the countries at the extremity of the East Indies, as several pieces of damask made at Surat, as also swords and other arms of iron. The natives stated that all these articles were brought to them from a commercial place which they called Barry, and which, as they say, lies journey farther east, at the foot of a range of mountains.

Thus we learn to account for these expeditions that the interior of Africa is much more populous than was supposed, and that several of the nations inhabiting it have attained a considerable degree of civilization.


NIMA. A genus of plants belonging to the natural order Simaroubaceae, of dry localities in some parts of the world. The plants have permanent calyx, 5 oblong petals, 5 stamens with filaments dilated at the base; the 5 ovaries are connected together, pilose, and seated on the thick disk beneath the ovary. The flowers are dioecious. The fruit is a small, dry, box-like capsule, from which the petals are, with alternate imparipinnate leaves, having four pairs of serrated leaflets. The flowers are disposed in paniculate corymbs.

N. quadracis is a native of Nepal, in a valley near the town called Thankot. It has elliptical oblong leaves, which are acuminate and serrated. The coryms are trichotomous. It is as bitter as the quassia of South America.

(Don, Gardner's Dictionary; Lindsey, Flora Medica.)

NINEVEH. Since the publication of the article NINEVEH in the 'Penny Cyclopedia,' discoveries of the highest importance have been made, if not on the precise site, yet in the immediate vicinity of it. The following are some of the most interesting particulars.

For these discoveries we are indebted to M. Botta, consul of France at Mosul on the Tigris, opposite to the presumed city of Nineveh. He was visited by his Excellency in 1843, announced to his friends his intention of employing what leisure the duties of his office might allow him in making excavations at Nineveh. He began with some operations in the immediate vicinity, but having been prevented from proceeding beyond the Daben, it was not until the spring of 1845 that he was enabled to proceed to the Guara, and Nineveh, however, to the excavations of the city. Here we look to the Assyrians for the symbols of those ancient times. It is ascertained that Nineveh was the residence of the kings of the Assyrians, and the seat of their government. It is stated that the city contained upwards of 100,000 inhabitants, and was surrounded by a wall of great strength.

M. Botta, the name, which is certainly not Arabic, is pronounced in all these ways), distant about five hours (caravan reckoning) north-east of Mosul, on the left bank of the little river called the Khaiser (Khosor). M. Botta's researches in this place not only proved more successful, but have led to discoveries of the highest importance, which, if the numerous cuneiform inscriptions can be deciphered, will doubtless throw great light on the ancient history of Asia. Commencing his excavations in a small mound, his workmen soon came to a monument, remarkable for the number and style of the sculptures with which it is adorned. About ten acres of ground have been excavated by M. Botta regularly communicated, during the progress of the work, with M. Julius Mohl, at Paris, to whom he wrote sixty letters, with drawings of the sculptures and copies of the most interesting inscriptions, and the drawings and inscriptions, in the 'Journal Asiatique,' and they have since appeared in one volume, with fifty-five plates. M. Botta regretted that he was not a competent draughtsman, and wished the government to send him a good artist; and as soon as the French ministry were aware of the great importance of the discoveries, they sent him M. Flandin, an able artist, who had lately returned from Persia, and granted sums of money to enable M. Botta to prosecute his researches. The following particulars are extracted from M. Botta's letters, and such parts have been selected as may be understood without the plates. Great quantities of inscriptions were thrown in his way by the ill-will of Mehemet, the Pasha of Mosul. All are now happily surmounted, and the excavations are terminated (in 1845). M. Flandin has
returned, with drawings of 130 bas-reliefs; and the greater part of the sculptures (weighing it is said above 300 tons) have been sent to Bagdad, to be embarked on board a vessel to sail for your port, under the orders of the Viceroy of Egypt; and the great number of the bas-reliefs has been deposited in the Egyptian museum. M. Botta is we believe now at Paris, with copies of 200 inscriptions, and will publish an account of his great discoveries, with engravings of all the sculptures and inscriptions he has collected.

From M. Botta's third letter, dated Momb, June 2nd, 1843.——I return with increasing astonishment from my discoveries at Chersâbâb. My operations have again brought to light the remains of one of the robenos of the temple. On the south, the north wall of the apartment there are, first, some figures of, which only the foot remain; then a bas-relief, on which there are two archers standing and two kneeling, who wear coats of mail, and have an inscription over them. These archers are shooting at a fortress, which is taken by storm. The fortress consists of an embattled wall, strengthened by projecting towers; at the bottom there are undulating lines, probably representing a river or the water of the moat. Within this wall there is an eminence with a castle upon it, from which arise what I suppose, from their red colour, to be intended to represent flames. At the other extremity there are three warriors armed with pikes, holding their shields over their heads, and ascending a ladder; others have already reached the top; and in the intervals between the towers others are mounting scaling ladders. At the other extremity and these are partly damaged; we only see that one of the soldiers pursues an enemy with his sword; a man pierced with an arrow is seen falling from the top of the wall and is cut off. The fortresses others are lifting their hands to heaven; at the bottom there is a row of wretches impaled. On the top of the hill there is a short inscription, probably containing the name of the fortress. The whole is very animated.

The attitudes are perfect, and though the heads of the figures are scarcely an inch long, the expression of the features is excellent.

After this bas-relief there are on the same wall five war-chariots following each other, turned to the fortress, and evidently meant to represent a battle. These chariots are all alike. The horses are in full gallop, and trample with their hoofs on a man lying on the ground. There are five persons in each. The principal figure wears a pointed, turban, and is discharging arrows; beside him is the driver, and behind them two warriors, armed with darts and wearing bucklers. Above there is a man who seems to be wounded, and thrown into the air with the head downward. The singular position of this figure is perhaps meant to indicate the confusion of the battle, or the rapidity of the chariot, which violently throws to one side those that are behind, so that the rear is extremely animated; the horses are particular in very spirited. The harness of the horses is very rich, and has evidently been coloured. These five bas-reliefs are each seven feet from the top of the wall; and on several parts of the foot of the wall there is a long inscription, which at first seems to be continuous, but it is certain that it is divided into parts, each bounded by the edge of the slab on which it is sculptured. Each line of inscription which separates the inscriptions, which differ in the number of lines.

M. Botta describes several other figures, and proceeds——

'This description of these newly discovered sculptures is very incomplete; to describe them in detail would require a volume. I doubt whether more richly decorated walls are to be found even in Egypt. In the whole monument there is scarcely a square foot which is not covered with sculptures and inscriptions. The mode of building is everywhere the same. The walls are formed of enormous slabs of gypsum or alabaster ten or twelve square feet, and scarcely a foot thick. These slabs are laid smooth and level, thicker than in Greek sculpture, but higher than the Egyptian. Though rather stiff they are well designed, the attitudes admirable, the muscles strongly marked, and the hands, feet, and dresses of the figures carefully modelled. The face isI	stated some particulars which may aid them in their researches. Though the hair, the beard, and the costumes resemble the Sasanian modes, I have found no trace of any inscription in a different character. I found on the monument itself: all the mythological emblems are Babylonian. I have not met with any trace of iron being employed in the monument, but many remains of articles of copper (quiver brass or bronze); nails, rings, and other ornaments of gold or jade, of a foot and a half in diameter. These facts indicate the antiquity of the monument; but on the other hand I have discovered that the stones with which it is built belong to a more ancient edifice. In fact, on my way to the temple I have on the back cuneiform inscriptions evidently injured by time, in characters exactly resembling those on the present monument.'

M. Botta in his fourth and fifth letter continues to give an account of the progress of his discoveries; among the most interesting are two colossal statues of bulls fifteen feet high, with human heads, and between them a passage seven feet and a half wide, forming, as he presumes, a portal of a striking character and of great magnificence. These bulls were winged; they are not proper statues, but in high relief. On clearing the passage it was found that the bodies of the bulls were continued on the walls in low relief. These figures are of large dimensions, 18 feet in length and in proportion. They have five legs, so contrived that from whatever side you look at them, one leg being hid by another, four legs are always to be seen. On each side of the passage is this inscription: the entrance, there is a figure with the head of a bird of prey; the hair is regularly braided, on the head is a sort of cap which comes down over the chest. The figure has a necklace, armlets, and bracelets, and wears a short tunic with a fringe girdle. On the opposite side of the chamber, M. Botta afterwards found a similar portal. M. Botta resolved to send two of these bulls to Paris.

This discovery cannot fail to engage the attention of the learned; but unfortunately the greater part of these remains has already disappeared. The walls are not solid, but formed of slabs of gypsum or alabaster, with an intervening space which is filled up with earth. 'This earth,' says M. Botta, 'has caused the walls to bulge in many places, and broken the sculptures into a thousand fragments since I have cleared them. Having nothing to support them, they would fall did I not take the precaution to shore them up as I proceed; but as these supports will last only during the operations that I am carrying on, the monument will necessarily perish entirely if the enlightened munificence of the French government does not furnish me with means to save the most interesting portions.'

In a report to the Minister of the Interior, M. Botta says, "I have visited the temples of Khorsabad and Nineveh; the latter had been suspended for two months on account of the heat, a much regret that a great part of the sculptures is already destroyed. The inhabitants have stolen the props which I had placed to support them; the rapidity of the walls to fall. I am extremely sorry that M. Flandin has not yet arrived.'

'I am still in doubt," says M. Botta to M. Mohl, 'respecting the destination of this monument: whether it was a palace or a tomb. The latter seems the more probable, because the interior must have been completely dark; for there is no appearance whatever of windows. At all events, the extreme richness of the decorations, and the number of battles represented, prove that it must have been built by a rich and powerful monarch.'

'It is to be hoped that the 300 tons weight of the sculptures sent by M. Botta to France, the 200 inscriptions, and the drawings of M. Flandin, will enable the learned antiquaries of Europe to throw much light on the history of those remote ages.

The writer of a private letter from Constantinople says, "M. Flandin's drawings, which we had the good fortune to see a few days ago, will greatly interest the public in general as well as antiquarians—the manners and customs, the art of war, the religious, and the domestic life, and the art in general."

A letter from Constantinople, of the beginning of 1844, says, "M. Botta has entirely given up his opinion that the slabs had belonged to another building. The reason is, that the figures from the angle of all the sculptures, have the two forms forming the corners being cut out of one piece, and have always been found at the back, as if the walls had always been succeeded by those figures being so placed that they could never be seen while the building remained entire. These figures are represented in all manner of religious, or mystical manner, and were purposely concealed, like the column which M. Flandin found in deep recesso in the walls; which could not be got at so long as the wall remained entire."
who built Khorsabad, are here delineated in mitful copies of the bas-reliefs. The principal figure in most of them is a sovereign, king, or hero; on his head he wears the tiara, his forehead is bald, his cheeks and beard fall straight on the shoulders and breast, terminating in large ringlets. The dress, which appears to have been extremely magnificent, consists of a richly embroidered tunic of cloth of gold, from one shoulder supported by the surplice or chasuble of the Roman Catholic priest. This figure appears, sometimes engaged in combat, driving his enemies before him; sometimes seated at an entertainment; and sometimes in solemn procession. He is accompanied, as is usual, with four horses abreast. Among the many figures of combatants, there is frequently a shield-bearer, under whose protection another warrior draws his bow or poises his lance.—There are no female figures, except one, which is rude and unfinished. But first took several figures for females, but afterwards changed his opinion, and thought they might perhaps be meant for eunuchs.

(Lettres de M. Boite, sur ses Découvertes à Khorsabad près de Ninive, publiées par M. Julluis Molt, Paris, 1845.

NIPADITDES, a genus of fossil fruits, from Shoppey. (Bowerbank.)

N. tinctoria (in Law), P. C.)

NISSOLIA (in honor of William Nissole, a French botanist), a genus of plants belonging to the natural order Leguminosae. It has a campanulate calyx, a papillose corolla, and ten monadelphous stamens. The legume is stipitate-pedicellate. The species are climbing shrubs, with imparipinnate leaves.

N. ferruginea has from 7 to 11 leaflets, which are alternate, oblong, mucronate, and clothed with rusty velvety down; beneath they are coriaceous, with prominent nerves, and the legume straight and rather velvety. The flowers are violeous. It is native of Guinea, and exudes from its stem a red transparent gum that has a powerful astrangent flavour. It is also known by the name of N. quinquefaria. It ranges itself on the surface of the plate in a state of rest: these are called nodal lines, and the figures which they form are called Acoustic figures. Again, if a glass rod be cemented at one end to the centre of a disk of the pass material, and be controlled by being rubbed, for example, with a wet cloth, so as to be put in a state of vibration longitudinally, those vibrations will be communicated to the disk, and light dust stove over the latter when in a horizontal position will arrange itself in acoustic figures. Or, if a glass rod be connected at each extremity to a glass disk at right angles to its length, on exciting one of the disks by drawing a violin-bow across its edge, the vibrations of that disk will, by means of the rod, be communicated to the other; and if light dust be stove over both it will arrange itself in figures: when the disks are equal and similar to one another, the figures are the same on both; otherwise they are different.

If a column of air in a cylindrical tube which is closed at either, or at each end be acted upon by the force of the breath, for example, applied at an aperture in any part of its length; it will emit vibrations. It is the largest of the pipes of the British species, and best adapted for the examination of the curious currents, which are obvious in the whole of the family to which it belongs. [Sar, P.C.]

NITELLA, a stem one to six feet long, smooth, flaccid, somewhat glossy and pellicul. It is not unfrequent in lakes and still waters. The nucles are often solitary. The stem, like that of Chara, is often incrusted with carbonate of lime. Hassall thinks this constitutes the only distinction of Agardh's N. opaca.

N. nidificus, has single stems, smooth below, flaccid, somewhat glossy and pellicul: the nucles and globules separate. It is a native of the salt water ditches in the south and east of England.

N. gracilis has smooth, glossy, pellicul stems, with whorls of the branches compound, the segments acute, the bracts wanting, and the flowers small delicate and elegant species, but probably not distinct from N. flexilis. In fact, it may be questioned whether all these species are not varieties of one. (Hassall, Freshwater Algae: Smith, English Botany.)

NODAL POINTS AND LINES. The former are those points in the length of a string extended between two fixed objects, or in a column of air confined at one or at each extremity, which, when the string or column is put in a state of vibration, is restored at rest to the latter at rest, and the latter at rest, corresponding lines which exist on the surface of an elastic body, usually a plate, whose parts are in a state of vibration.

It is well known that if a string or a metallic cord be attached at its extremities to a board or plate, on causing it, when in a state of tension, to vibrate transversely, there may be distinguished, besides the principal sound, which is due to the length of the string, several others which have a greater or less degree of distinctness: they are considered as resulting from some property of the extended string, by which, when in a state of vibration, it becomes a sort of moving axis, having on it points, at distances from each other corresponding to the several degrees of flexibility in its different parts. The string between every two such points is in the same condition as if it were a line perpendicular to it. But first took several figures for females, but afterwards changed his opinion, and thought they might perhaps be meant for eunuchs.

A string of considerable length, on being made to vibrate, will be found to have several such nodal points, and the curves which the intervals assume in consequence of the vibrations, though alternately on opposite sides of the axis of the string, are equal and similar to one another. The situations of the nodal points may be made evident by placing, at intervals, across the string, pieces of paper notched or bent in the form of an inverted V, those which are at the places of the nodal points remaining stationary while the others experience considerable agitations, or are thrown entirely off.

If a string, in a state of tension, has its extremities attached to a board or a plate of metal, and be made in some part of its length to vibrate, it will be found that the board or plate, the vibrations of the string, when a violin-bow is drawn across it, will be communicated to the plate; and if over the latter light dust be stove, that dust will be agitated and made to arrange itself on the surface of the plate in a state of rest: these are called nodal lines, and the figures which they form are called Acoustic figures. Again, if a glass rod be cemented at one end to the centre of a disk of the pass material, and be controlled by being rubbed, for example, with a wet cloth, so as to be put in a state of vibration longitudinally, those vibrations will be communicated to the disk, and light dust stove over the latter when in a horizontal position will arrange itself in acoustic figures. Or, if a glass rod be connected at each extremity to a glass disk at right angles to its length, on exciting one of the disks by drawing a violin-bow across its edge, the vibrations of that disk will, by means of the rod, be communicated to the other; and if light dust be stove over both it will arrange itself in figures: when the disks are equal and similar to one another, the figures are the same on both; otherwise they are different. If a column of air in a cylindrical tube which is closed at either, or at each end be acted upon by the force of the breath, for example, applied at an aperture in any part of its length; it will emit vibrations. It is the largest of the pipes of the British species, and best adapted for the examination of the curious currents, which are obvious in the whole of the family to which it belongs. [Sar, P.C.]

These portions are separated from one another by sectional areas in which the particles are at rest: the condensations, or rarifications, of the air being affected, while, in the intervals, they will be greatly agitated. It, in the side of a tube containing a column of vibrating air, any aperture exist by which that air is enabled to communicate with the atmosphere, the air in that section becomes in equilibrio with the latter, and, in that section, there is consequently neither condensation nor rarefaction; this section corresponds to the middle points between two nodes in a vibrating string.

Vibrations corresponding to those which are produced in strings or rods and in columns of air may be conceived to take place in any solid bodies or in any elastic fluids whatever be the figure, and the latter at rest, the corresponding lines which exist on the surface of an elastic body, usually a plate, whose parts are in a state of vibration.

It is well known that if a string or a metallic cord be attached at its extremities to a board or plate, on causing it,
are found to take place parallel to the surface, and others perpendicular to it: the former being called tangential, and the latter normal vibrations. In one case the particles of dust glide upon the surface in directions which tend alternately towards and from the nodal lines (the movements in the former direction being always more rapid than those in the other) till they come to a state of rest on those lines: in the other case the particles alternately rise from and fall back upon the surface at the places where the latter is in a state of vibration; and, dispersing from those places, they become quiescent in the lines of no vibration.

Galileo was the first who observed (Dialogo delle Scienze Nuove) that the vibrations of plates might be rendered visible by covering the plates with fine sand; and he remarked that the sand became accumulated at the parts where the vibrating plate was in a state of rest: but this subject was extensively investigated by Dr. Chladni of Wurttemberg, who first discovered the longitudinal vibrations of solid bodies; and, in 1787, published, in a work entitled Entdeckungen über die Theorie des Klanges, an account of numerous experiments which he had made on the nature of the vibrations produced in plates of glass of different forms.

The plates with which such experiments may be performed should be of good window glass; and, if square, from 4 to 8 inches each side; if circular, their diameters may be within the same limits: in making an experiment the plate must be held horizontally between a finger and thumb, or it may be fixed within the lips of a clamp screw; and when it is required to prevent any particular part of the plate from vibrating, that part, if on the edge, may be pressed against a fixed object, or, if at any part of the surface, one of the fingers of the hand may be pressed gently upon that part. The plate being in a horizontal position it must be covered with a layer of fine dust; and it may be put in a state of vibration by drawing a violin-bow across its edge: the dust will then arrange itself in figures which will vary with the form of the plate, and from the way in which the bow is applied, and that in which the plate is held. If, for example, a square plate be held at its centre, and the bow be applied near one of the angles, the dust will arrange itself in lines so as to divide the plate into four equal squares (No. 1). If the plate be held as before, and the bow be applied at the middle of one of the sides, the vibrations will be such as to make the dust lie in the directions of the two diagonals (No. 2). Again, if the plate be held at A (No. 3) and the bow be applied at B, the dust will assume the positions of three lines parallel to one another: and if the plate be held at a point nearer the edge, the lines will become curves, as in No. 4.

If a circular plate, held at its centre, be pressed against a fixed object at any point on its circumference, and the bow be applied at 45 degrees from that point, the lines will take the positions of two diameters at right angles to one another, one of them passing through the point at which the circumference touches the object. A greater number of radiating lines than four will be produced if the bow be drawn more rapidly and with less pressure against the edge of the plate than in the former case. If the centre of the circular plate be free, various curve lines will be assumed by the dust, according to the position of the point which is held; and one of them is represented in No. 5. The figures represented in Nos. 6, 7, and 8, are selected from the great number which Chladni has obtained with glass plates of a circular, a polygonal, and a triangular form.

M. Felix Savart has observed, that if a rectangular plate of glass about 27 inches long, 1 inch broad, and 4 inch thick, be held horizontally between a finger and thumb at the middle of its opposite edges, and be put in a state of longi-

tudinal vibration, either by rubbing its under side, near one of the ends, with a wet cloth, or by striking it gently at one end, the dust on the upper surface will arrange itself in lines perpendicular to the length of the rod. It is remarkable, that when the plate is thus held, the vibrations being held as before, and vibrations be produced in like manner, the places of the nodal lines will be opposite to the middles of the intervals between the lines observed in the other position of the plate—a circumstance which proves that the motions of the particles in one half of the thickness of the lamina of glass are directly contrary to those in the other half. A like effect has been observed when cylindrical rods have been made to vibrate longitudinally; the line of nodes then assuming a spiral form about the cylinder, and the curves consisting of portions which run alternately in contrary directions: the points of greatest and least inclination to the axis of the cylinder are at the same distance from each other with respect to a line drawn on the surface parallel to the axis, and the effect is such as would arise if the cylinder were divided longitudinally into four quadrantal portions, having opposite qualities. The places of the nodes on that part of the rod which was uppermost were found, the rod being held in a horizontal position, by annular pieces of paper loosely encircling it.

In 1822, M. Savart read to the Académie des Sciences at Paris, an account of some curious experiments in which acoustic figures were produced in consequence of vibrations communicated through the air to elastic membranes. (Brewster's Edinburgh New Journal of Science.) A sheet of thin paper was slightly stretched over a glass vessel four or five inches in diameter, and on it was strewed light dust. A thin circular plate of glass, in a state of vibration, was then brought into contact with the paper, and the vibrations were communicated to the latter, and, the paper being of uniform thickness and well stretched, the dust assumed figures which were perfectly regular. M. Savart, having rendered the glass plate immovable at opposite points by confining it by drawing a violin-bow across its circumference. In these circumstances, on presenting the plate to the stretched paper, the following appearances were observed. The nodal figures on square paper were analogous to those formed on a square plate of glass or metal, and on circular plates their general character was circular. The circular lines were sometimes cut by diametrical lines which formed nodal points, or stars, and the number of these increased with the acuteness of the sound produced by the bow. When the plate of glass was parallel to the paper, the nodal lines were similar on both, as when two plates were connected with each other, by a rod at some distance, one fifth of the circumference of the glass plate was held vertically, the nodal lines on the paper became parallel to one another; and the figures on the paper changed as the glass plate was made to decline from the vertical position.

NODIER, CHARLES, was born at Besançon, in France, on the 29th of April, 1780. Under the care of his father, a man of stern principles and of a cultivated mind, he acquired in early life a considerable disposition for the acquirement of knowledge. At the age of twelve he entered on a course of classical study, which was, however, soon interrupted by the events of the Revolution, the principles of which his father, at that time mayor of Besançon, was solely espoused. During the Reign of Terror young Nodier employed himself in writing poetry and composing tragedies on classical subjects. These early compositions he was accustomed to read to an aged friend, who judiciously advised him to devote himself to more serious pursuits. The beneficial consequence of his advice became manifest, when five years afterwards he published a work of considerable research and great critical acumen, entitled "Le Dictionnaire des Oceanes," a monograph of French verse, in which the dictionary of words which derive their signification directly from the action which they represent (soupir, 'a name,' and soupir, to make'), as the verb 'to hiss' in our language, and 'suffler' in French. At the request of the Bibliothèque de France, it was used as a class-book throughout France, and a copy of it, by order of government, was placed in the library of every Lyceum or public school. The preface of this remarkable work on phonetic language is a great classic, and is not inferior in style to any of his later productions. During the same period of the Reign of Terror he formed an
acquaintance which terminated in the most intimate friendship with Mme. de Chateauroux, a Royalist officer, who was compelled to seek for safety in a retired country-life; through him, Nodier continued his research in the study of natural history, to which he afterwards devoted a considerable portion of his time; it was especially to the minute examination of insects and flowers that he attached himself, and his taste for it is strongly reflected in his ‘Flora de Paris’ (1817). He published in 1798 the result of his studies in a dissertation on the organs of hearing in insects, and in 1801 in a small work entitled ‘Bibliothèque Entomologique.’ In 1796 Nodier had gone to Paris to attend the meetings of the natural philosophers; he had been introduced into the best literary societies of that time. Two years afterwards he retired to his native town; but the novelty of a province and the monotony of a provincial life, he sought for novelty in the society of the political prisoners and suspected Royalists, who at that time abounded at Beaunoy. His imprudence, however, became the fortunate means of bringing his talents more prominently into notice. The convention was keeping him under the suspicion of the government, and his room was one night forced open and searched by the police agents, and his papers placed in the hands of the prefect, Jean Debray, one of the deputies of the French Republic, who was imprisoned at Rastadt by the Austrians. While searching among his papers for some traces of a political plot, Debray met with the manuscript of the ‘Oeuvres des Comédiens,’ a surprise to discover the deep research and learned disquisitions contained in a work of a young man whose habits were apparently so frivolous. With just discernment he perceived to what importance this work might be applied, and that a mind of this brilliant imagination and so persevering in study. Under his influence the work was published, with the success already mentioned.

At the Revolution which placed Napoleon on the throne, Nodier, who during the most turbulent periods of the Republic had expressed opinions favourable to the Royalists, became under Napoleon a sure Republican. Indeed, in the strict scotetion of the time, he had no political opinions. To this disposition his mind always prompted him to oppose the prevalent tendencies of the age. Thus, under the Republic, which discontenunted religion, Nodier professed openly the most religious sentiments; under the Consulate, he was at one time a Girondist, at another a Vendéan; under the Empire, he was a discontenunted Liberal; under the Restoration, he was the husband of the political party which had brought to the scaffold the brother of the reigning king. The following remark made to a young friend, who has lately published a most interesting relation of his life, is the best index of his disposition: ‘My child,’ he one day said to him, ‘of whose name I no more speak, under the suspected republican, and several men had already been arrested; when Nodier acknowledged the poem as his own. An imprisonment of some months was the result, at the expiration of which he was sent back to his native town, and placed under the inspection of the police. These measures of the government, as they were the means of excluding him from society, enabled him to devote more time to literature, and he especially attached himself to a critical study of his own language. It was during this period that he appeared his ‘Examen critique des Dictionnaires de la Langue Française;’ a work replete with the most learned and instructive remarks. To this period also is to be assigned his ‘Esquisse du Dictionnaire,’ which he composed while wandering over the country to avoid the watchful persecution of the government agents. After some years spent in this manner of life, he retired to Dôle, where he gave public lectures on French literature, which met with success unprecedented in a small country-town. It was there that he first became acquainted with Madeleine Desirée Charvès, a lady of great accomplishments and personal attractions, whom he afterwards married.

Nodier spent the first years of his married life at Quintigny, near the Jura; it was amongst the picturesque woods and meadows which adorn the neighbourhood of that town that most of the poems which have added so much to his celebrity were composed. The necessity of providing for the subsistence of his family obliged him to abandon the charms of a country life in order to settle in Paris. Previous to leaving Dôle he had studied the natural history of that town, which was attached the sum of 1000 fr., about 40l. a year, but the corporation, with a singular want of discernment, had refused it to him. In Paris he continued his literary labours near the end of the year 1810, he became a regular contributor to the ‘Journal des Débats.’ A short interruption to his residence at Paris was caused by the acceptance of the office of librarian at Laysback in Hylès, with the salary of 1800 fr., half of which he paid to an old man who had been his predecessor. The restoration of the Bourbons produced little change in the fortunes of Nodier; he continued attached to the ‘Journal des Débats,’ which paper he afterwards made the direction of the ‘Quotidienne.’ This period of Nodier’s life was rich in literary labour; each successive year he produced a work, which, taken by itself, was sufficient to confer celebrity on the author. In 1818 appeared his ‘Jean-Siflet,’ in which he displays an intimate knowledge of German literature; in 1819 ‘Théâtre Hubert,’ a short romance remarkable for the unaffected beauty of its style and the simple development of its plot; in 1820 ‘Adèle,’ another instance of the German; in 1821 ‘Smarra,’ derived from the writings of Apuleius, and ‘Trilby’ in 1822.

Nodier exposed shortly after this nomination to the important situation of librarian to the Arsenal at Paris. Nodier’s rooms at the Arsenal soon became the resort of the most distinguished literary men of the capital, who were attracted neither by the novelty of the office of the librarian, and by the charms of his brilliant and learned conversation. Among the most constant of his visitors were Victor Hugo, Lamartine, Alexandre Dumas, and Ste. Beuve. It is not the least surprising fact connected with the life of this remarkable writer, that amongst his incessant occupations of his situation, and the time which he devoted to the society of his friends, he should have produced so many works, all of which bear the stamp of originality, and are before impossible even to enumerate all his productions. He was a contributor to the ‘Bibliographie Universelle’ and other publications, and the originator of the ‘Grand Dictionnaire Historique,’ while almost daily publishing various works of a more popular character, such as his ‘Souvenirs de la Jeunesse,’ ‘Jesu de las Serres,’ ‘Les Fantaisies du Docteur Néphobus,’ ‘Dernier Banquet des Girondins,’ and ‘Franciscus Columna,’ his last and perhaps most remarkable novel. In 1834 the French Academy met him to the tardy justice of electing him a member of their body in the place of Mme. Layat.

At length, under the effects of constant application, Nodier’s health began todecline, and he died, as the witness, the event of May 27, 1845, was the last in which he was permitted to enjoy the society of his literary friends. Three days after he was taken with a serious illness, more lingering than painful, and expired on the morning of May 29th.

Nodier’s character is described by those who enjoyed the privilege of his acquaintance as peculiarly amiable and unaffected. With more than an ordinary disposition to raillery and sarcasm, he never tempred the salutary consideration to those against whom they were directed. The father of a family, who maintained by the most incessant literary labour, he had none of that irritability of temper too often the accompaniment of genius. When he was placed under the necessity of administering reproof, it was disarmed of offence by the simple modesty of his manner: to an acquaintance who had brought him a work for his perusal, in which he had made a later edition in his book, he remarked: ‘My friend, what you have given me to read cannot be very good, for, at first sight, I mistook it for my own.’

His peculiar characteristic as a littérateur is that he developed the energy of his mind no special object to which, but to write the almost every subject, and that in a way that leads one to suppose that, had he been attached to it, he might have attained the highest eminence. As a poet his merit consists in the purity of his style and diction of his thought, and his adherence to his best classical models. In one respect he deserves especial praise, the substance and moral of his works, and their complete purity as his style.
The species of Nolana are only valuable as ornamental plants; they are showy when in blossom, and are much liked by some of the trailing species of Convolvulus. The seeds should be sown as early as possible, and covered with a thin layer of soil. When the plants are of sufficient size or about the middle of May, they should be finally transplanted to the open ground, where they will flower and ripen seed; or the seeds may be sown at once in the open ground and transplanted to the garden later on. (Doe's Gardener's Dictionary; Barnett's Outlines of Botany.)

NOLLET, JEAN ANTOINE, a distinguished French philosopher, was born at Paimpô, in the Noyonnais, in 1700. It being the intention of his father, who held a farm in that part of France, that he should embrace the ecclesiastical profession, he was sent to the college of Beauvais, in order that he might prepare for the study of theology; but his taste inclining him to cultivate the physical sciences the intention was abandoned, and he was never otherwise connected with the church than by holding deacon's orders with the title of Abbé. On leaving the college he went to Paris, where he attended a course of lectures on natural philosophy, the subjects of which he studied with great diligence, repeating in his humble dwelling the experiments which he had seen performed in public. He passed many of his leisure hours in the practice of enamelling; and he is said, at one time, to have superintended the education of a son of M. Talbot, who held the post of recordman.

The Abbé Nollet supplied himself particularly, in conjunction with M. Dufay, to the subject of electricity; and he soon became distinguished by the number as well as the ingenuity of his experiments with relation to that science, performing them with great success and exactness. By his own means he contrived to make use of his valuable apparatus. He was the first who observed that pointed bodies, when electrified, gave out streams of light, but did not exhibit in other respects the phenomena of electricity, and that the smoke produced by the blunt bodies; and he found that the smoke of burnt linen and wood, and the vapour of water, were better conductors of electricity than the smoke of gun-cotton, trompette, or sulphur. He ascertained that an excited body lost none of its electricity by being placed in the focus of a concave mirror when the sun's light was concentrated in that point; that glass and other non-conductors were extremely strongly excited in the air; and that oil of turpentine on a woman's cloth was capable of producing the electric fluid in abundance; he observed also the diffusion of the electric light in vacuo. He distinguished the rays, and thus augmented the natural evaporation of fluids, and that the effect is the greatest when the fluids are contained in non-electric vessels.

In repeating the experiments of M. Boze on the effects of electricity on the scalding of fluids through tubes of iron, Nollet found that no acceleration took place when the bore of the tube exceeded ¼ inch in diameter; he ascertained however that if the bore was very small the electrified fluid did not pass through it. The absence of this resistance of his apparatus, Nollet, in 1752, performed a brilliant appearance when the experiment was performed in the dark. He electrified, during several days, the mould in a garden pot, in which seeds had been sown, and which was provided with a small window of his window. As soon as it appeared to him that the plants grew faster and produced shoots earlier than the plants obtained from the like seed in a pot containing the same kind of mould, which was not electrified. Nollet electrified in the like manner camomile, violets, sparrow, &c.; and he imagined that the animals were lighter than those of the same kind which were not so treated; from thence he concluded that electricity increases the insensible perspiration of animals. A communication of this experiment will be found in the Philosophical Transactions for 1748; but it ought to be observed that experiments relating to the effects of electricity on plants and animals have, since been frequently repeated without confirming the conclusions of the French philosopher; and it may be added, that the attempts which have recently been made to promote the growth of vegetation by an apparatus for conveying to the ground the electric fluid in the atmosphere, have been equally fruitless.

In 1734 the Abbé Nollet, accompanied by his friend M. Dufay, made a visit to England, when he was elected a Fellow of the Royal Society of London: he went from hence to Holland for the purpose of conversing with the philosophers of that country; and, on his return to Paris, he delivered a course of lectures on physics, which was well attended. In 1759 he was elected a member of the Académie des Sciences; and, during the same year, he went to Turin, where he repeated his electrical experiments in presence of the Duke of Savoy. In 1742 he went by invitation to Bordeaux, where he delivered a course of lectures; and, in 1749, by invitation of the academician of Paris, in the presence of the dauphin of France, the son of Louis XV.

Nollet made many experiments to ascertain, at various depths under water, the intensity of sounds excited in the air; and he perceived that the striking of the string of the harp, or the blowing of a hunter's horn were heard distinctly, but very faintly, at two feet below the surface. He was not fortunate however in his hypothesis concerning the nature of the electric fluid; he imagined that this fluid has two motions, viz., an afflux to the electric body and an efflux from it, and he supposed that, in consequence of the former, all light bodies are attracted or carried towards the electric; while, in consequence of the latter, they are repelled. He was also considered that all bodies have two different kinds of pores, one kind for receiving and the other for emitting the electric fluid. This hypothesis has never been admitted by philosophers.

In 1747 Signor Pivati, of Venice, published a pamphlet in which it was stated, that a man who had suffered from a pain in his side had by him been cured on being electrified with a machine in the glass cylinder of which was contained some balsam of Peru; and that two persons of great age had been cured of the gout by the like means: the benefit was supposed to have arisen from the effluvium of the balsam, which was stated to be so great that the bed and even the whole apartment of one of the patients who had received it was strongly perfumed with it. Professor Winkler of Leipzig also stated, about the same time, that he had performed similar experiments on persons affected with the gout, and that they were much relieved. It was considered that all bodies have two different kinds of pores, one kind for receiving and the other for emitting the electric fluid. This hypothesis has never been admitted by philosophers.

In 1756 the king of France endowed a chair of experimental philosophy at the college of Navarre, and he appointed the Abbé Nollet to superintend it: the zeal and ability with which the latter fulfilled the duties of his post gave full satisfaction to the king, who conferred on him the title of Master of Philosophy and Natural History to the Royal Family. Nollet was subsequently appointed Professor of Experimental Philosophy to the School for Artillery, which then existed at La Fère, and he finally removed to Paris.

He died April 24, 1779, in the Louvre, where the king had assigned to him a suite of apartments: the amiable disposition of his character was equal to his talents; and it is said that he was devoted nearly as much to the interests of his clients as to those of his parents while they lived. Besides being a Fellow of the Royal Society of London and a Member of the Académie des Sciences at Paris, he was a Member of the Institute of Bologna and of the American Philosophical Society.

The Abbé Nollet published at Paris, in 1743 and the succeeding years, a work entitled 4 Leçons de Physique Expérimen-
mentale,' in 6 vols. 12mo; this is considered as the most magnificent work of that subject which was at that time appearing, and it was the first in which the discoveries of Newton respecting the phenomena of light were stated in a popular form. His second work is entitled, 'Recherches sur les Couleurs dans les Phénomènes Éléctriques,' in 12mo of 1748; and the third, 'Essai sur l'Electricité des Corps,' 12mo, 1750. He also published, in 1758, his 'Recueil de Lettres sur l'Electricité,' in 3 vols. 12mo; and a work by him enti- tled 'Discours sur des Expériences,' was published in 1770, also in 3 vols. 12mo; this work contains the elementary prin- ciples and the practice of the mechanical arts.

(Épigraphie Universelle; Philosophical Transactions for 1748.)

NONATELLIA, a genus of plants belonging to the natural order Rubiaceae, the tribe Gustarteeae, the subtribe Moritandee. It has a calyx with an ovate tube, and a 5-toothed permanent limb; a tubular funnel-shaped corolla, with the tube as if it were gibbous, and a 5-lobed limb; the stamens five, almost inclosed; the stigma (2?) obtuse; the fruit a globose drupe, farrowed, containing 5 coriaceous 1-seeded pyrums; the albumen horny. The species are shrubs or small trees with glabrous downy-ovate-oblong leaves, and the stipules combined together more or less or free. The flowers are white and arranged in a paniculate-formed or corym- bous paniculato.

N. officinalis, A. H. Bush, has ovate, acute, glabrous leaves, the stipules combined into a 4-toothed sheath, the paniculate corymbose; the involucrum small, 3-leaved under each flower; the flower stalk is native of Guiana. It occurs in the forest, and similar places. All the parts of this plant, when bruised or dried, give out a slight aromatic odour. The creoles in Guiana call this plant Axier àusage, and it is said to have a powerful influence in subduing attacks of asthma.

There are several other species of Nonateilla, all natives of America, but some are used in the arts or as medicines.

(Loeb's Flora Medica; Barnett, Outlines of Botany.)

NORD, département DU. In our notice of this department of France, [Nord, P. C. vol. xvi. p. 258, &c.] references were given to articles CAMEM, CAMBEL, and GRAVELINES, from which in their places, references had been given to the article NORD. We here supply a brief notice of those two towns.

Cassel is situated on an isolated eminence, the summit of which, Mont Cassel, close to the town, rises to the elevation of from 300 to 350 feet, in the midst of a level country; and commands a prospect of great extent, comprehending more than thirty towns, and extending to the sea. Two streams, (one of them the little river Poeoe,) which flow into the Yser, rise near the town and furnish the inhabitants with a constant supply of water. The town, which was antiently fortified, has two gates, with large and strong gate-pierces, which have lately laid out. The population of the commune by the census of 1831 was 4234; by that of 1836, 4495; about three-fifths in the town, the rest in the neighbourhood. Some lace, stockings, hats, and coarse linen, are manufactured. There are oil-mills, and a considerable trade in cattle is carried on. Cassel has one yearly fair of seven days. The town has some historical interest. It is thought to have been one of the strongholds of the Morins, and was known in the Roman period by the name of Castellum Morinarum, whence the modern name Cassel. In the middle ages it was the scene of two severe conflicts. In a.d. 1071, Philip I, King of France, was defeated at Cassel by Robert Le Frison, who had usurped the county of Flanders from his nephew Arnulph, whom Philip supported, and who was killed in the battle. In a.d. 1298, Philip VI. de Valois, King of France, vowed a war against the Flemish insurgents who had surprised him in his camp. In later times a.d. 1677, William, Prince of Orange, after- wards William III. of England, was defeated here by the French under Lebrun. The town bears its name in the armistice of Hasembrouck, 148 miles from Paris by Amiens, Douai, Lille, Aire, and Hazemerbrouck.

Gravelines is near the coast between Calais and Dunkerque, in the department of Dunkerque, 148 miles of Dunkerque, 20 miles N. of Calais, and 170 N. of Paris by Beauvais, Abbe- ville, Boulogne, and Calais. It is a small town, but strongly fortified with a good citadel, but has very little trade. The Aa, a river that is the town for fishing is carried on, and small vessels are built. The town is laid out with tolerable regularity with wide streets. There are a church, a nunnery, a military hospital and ser vice. The population in 1826 was estimated at 10,000. The number of population in 1831, was 13,418; by that of 1836, 16,462. It is the chief place of the canton of Gravelines. The town has some historical interest from the defeat of the French in a.d. 1658 under the command of Marelle, and of Caumont, in the battle of Gravelines, assisted by some English ships that were off the coast.

(Malte Brun, Géographie: Vayme de Villiers, Itinéraire Descriptif de la France; Annuaire du Dép. du Nord; Paris, 1836; Dictionnaire Géographique Universel.)

NORFOLK ISLAND PINE. [Aburcaaria, P. C.]

NORMANDY, CUSTOMARY LAW OF. Previous to the Norman invasion the several districts of France were divided [Franchise, P. C.] were chiefly governed by a system of laws which, originally arising from the local usages and customs of the people, became, after time embalmed in a code which, after it had received various modifi- cations, obtained the sanction of the sovereign, and became the written and established law of the province. These codes were styled customs, coutumes, and have been largely and learnedly commented upon by various jurists of the period; their commentators were often received as law; thus we have the customs of Burgundy, Brittany, &c., commented upon by Bouvier, D'Argentiére, &c. The customary of Normandy, if not the most ancient, ranks certainly among the most perfect of the French provincial customs. According to it laws, customs, and usages, were regulations of a very different order and authority: the laws were enacted by the sovereign power, and only reduced to writing by the sovereign's grace; the customs and usages denominated the parliament of Rouen; its customs or- iginated with the people, and in time were compiled and reduced to writing by the supreme authority. Hence the dif- ference between 'loi,' 'usage,' 'coutumier,' and 'usages,' as understood in the ancient provinces of France. By 'loi' or law was understood the royal ordinances and Roman law; by 'coutumes' or customs those regulations which had been reduced to writing and received the sanction of the sovereign; by 'usage' or usages, such regulations as had not been reduced to writing. Normandy, as an independent state, and after its annexation to the crown of France under Philip Augustus [Normandy, P. C.], may be said to have had three distinct codes: 'la grand coutumier' or ancient customary, 'la charte aux Normands,' or Norman charter, and the modern customary. The ancient and modern custom related more particularly to property, &c., 'la charte aux Normands' to the political and civil rights of the subject. The Norman charter was granted by Louis X., and its principal object was to restrain the kings of France from imposing too heavy burdens on their Norman subjects. This charter was confirmed six times from its pro- mulgation to the reformation of the customary by Henry III., which fact affords a fair presumption that it had been often vio- lated. The laws of Normandy, as laid down in writing by a private hand in the reign of Louis IX., about the year 1229, which corresponds with 14 Henry III. of Eng- land. Being subjected to examination under Charles IX., many of the laws were sanctioned, and confirmed in 1641, by the Cancellier L'Hospital, and the modern reform dates from 1855 under Henry III. This custom was known throughout France by the appellation of 'la sage coutume.' The number of provincial customs of France before the Revolution were reckoned at eighty, and its local usages at nearly three hundred. In Normandy there were no less than twenty-two different modes of devising patrimonial estates, which corre- sponded to the number of vicomtes or districts of which the province was composed.

The oath of a Norman duke so late as the thirteenth cen- tury differed very little from that of a king of France: he swore to the discharge of his feudal duties, to the preservation of the unity of the kingdom, and to the obedience of the orders of the community by the impartial administration of justice, and more particularly to govern according to the Nor- man charter.

'1. A. a. a. Contumier' is divided into 125 chapters, nearly two-thirds of which are devoted to regulate the duties of the judicial officers, the proceedings in the different courts, and the respective rights and obligations of the kings of France, the duke of Normandy, the prince of Conis, the bishop of Bayeux, the duchy of Normandy, and the subject. As the power of the kings of France was very inferior to that of the dukes of Normandy, and even to that of the counts and great territorial barons, who in those days monopolised the land, and governed with it like kings, the rules of wills and inheritance, which occupy so large a portion of mod- ern law and of the reformed Norman law in the sixteenth
...the first time, from a manuscript lent him by the Marquis de Paulny, a poetical version of the customary of Normandy. Several manuscripts of this poem then existed; in one of them there was the following prologue, which, if authentic, determines its date and author:—

"Mil deux en ses quatre vols (1680)".

"A la mer de la Christ vint
Et retraite sommeign de l'imagi
Pour rendre nous, comme ses blancs,
Et par ses beaux goûts s'amuse.
O! Adam ne tailli plus,
Quand tu n'as réçu que faire.
Moi Richard D'our nel n'est
En mine qui puet pas.
"Pour le ver, le pré des fables."

There appear however at the end of the MS. of the Marquis de Paulny, which did not contain the above prologue, the following lines:

"Qud mon nom vouloit apprêter
Mes vigiles et pour vos veux
Sens le jacquier atout.
Cil y met C. A, U, P, H."

This interesting relic of ancient poetry is of considerable length, and is divided into 147 chapters; the language and details afford internal evidence of its having been composed in the thirteenth century.

The following definition of "coutumes" may be taken as a specimen of the style of 16th century literature: 

"Coutumés sont cest vieux usages
Approvés par les Princes ses
Dans sa patrie et sa mère
A s'en aviser quoy que doux prendre;
Et pour leur usage
Des douze et douze introductions,
Et des succédues
Les droits sans nul sort se doivent;
Rien de doux ni de courtois
Les droits sans retour ni appelants;
Et des coutumes, non les gens
Profes que directeurs, actifs communs

CHAP. XV.

The following is the best edition of writers on the subject of the Coutumier of Normandy:—Décisions sur chaque article de la Coutumiere de Normandie, et observations sur les usages locaux de la même Coutumie, par Pierre de Merville, Paris, 1783, in fol.; Bérault, Josias, an advocate of the parliament of Rouen, died 1820, Commentaire sur la Coutumière de Normandie, Rouen, 1804, in fol.; Basnage, Henri, born 1615, died 1695, Commentaire sur la Coutumière de Normandie, Rouen, 1678-1681; Godefroy, Jacques, Coutume du Peuple et Duché de Normandie avec les Commentaires de Bérault, Godefroy et d'Avoiron, Rouen, 1804, 2 vol., fol.; Flaut, Jean Baptiste, born 1711, died 1783, Explication de la Jurisprudence et de la Coutumière de Normandie, 2 vol., fol.; Péneille, Coutume de Normandie avec les observations de Ropnel, Rouen, 1759, 4 to.; Houard, David, born 1726, died 1808, Traité sur les Coutumes Anglo-Normandes, Rouen, 1777, 4 vol.

Hale, in his 'History of the Common Law of England' (chap. vi.), maintains that the 'Coutumier of Normandy' was written long after Glanville's tract, which was written in Henry the Second's time, and that the Norman collection was made after the time of Henry II. 

The term 'Coutumier' appears to have been made after the act of settlement of Normandy in the crown of France, for therein is specified the institution of Philip king of France, for appointing the coronation of king Richard I. for the limitation of actions, which was after the said Philip's full possession of Normandy.

Hale's opinion is that 'this similarity of the laws of England and Normandy was not by conformation of the laws of England to those of Normandy, but by conformation of the laws of Normandy to England.'

NORONHA, FERNANDO DE, is a small group of islands, belonging to Brazil, and situated in the Atlantic Ocean. The fort Concepcion on the principal island is situated 5° 50' N., lat. and 32° 13' long. The island is about ten miles long and about three across, in the widest part. The surface is mountainous, and on it is a peak which resembles a steap or tower, which is two or three thousand feet high. The soil is stony, and there are only a few small spots susceptible of cultivation. There is no harbour, and the surf runs high over the rocks, and makes it difficult to get to land. It has good water, which however is difficult to get on board the vessels, which visit this island for a supply, on account of the surf. To the north, and separated from it by..."
a narrow channel, is the Island dos Rattes (of the rats), which is three miles long, less stony and more wooded. These islands are used by the Brazil government as a place of sepulchre for the British soldiery, and their numbers amount to about eighty hundred, and the garrison consists of two hundred black soldiers. They cultivate a small quantity of mandio, a few fruits, and a little corn, and keep some hogs, that live well in this wild state, the descendants of those which have fled from the houses, are numerous. No boats are kept on the island, and no intercourse is held with shipping, without permission and the strictest in- 

(Henderson's History of the Brasil; Narrative of the Surveying Voyages of the Adventure and Beagle.)

The Morall Philosophie of Doni, drawn out of the ancient writers; a work first compiled in the Indian Tongue, and afterwards reduced into divers other Languages; and now lastly into the Latin. In 1681, 1689, 1691, 1693, 4to.

The book, besides the Lives of Plutarch, contains 'The Lives of Epaminondas, of Philip of Macedon, of Dionysus the Etruscus, of Thales of Ephesus, of Aristarchus of Samos, extracted out of good Authors; also the Lives of Nine excellent Chieftains of the Etruscans, taken out of Latin from Esyllus Probus, by S. G. S., by whom also are added the Lives of Plutarch and of Seneca, given in his works, and earnestly recommended for Study. The work is now translated into English by Sir Thomas North, Knight.'

This part of his book is also dedicated by North to Queen Elizabeth, to whom he seems to have been indebted for some kind service.

In 1689 he was admitted fellow commissary of St. John's College, Cambridge. He afterwards became a member of the Middle Temple. He passed his time gravely and studiously, and appears early to have resolved not to leave any plan untried, whether by his own strength, time, and labor, or by the advice, wealth, power, and distinction of his friends. His relaxation consisted of music meetings, hearing Hugh Peters preach, and occasional convivial sallies with fellow-students—very small items of dissipation, the nature of the times and the habits of the young

lvery of the Restoration considered. He was well-connected, and received some aid and supplies from his relatives in his early struggles. His practice however was for some time small, being chiefly exercised amongst the middle classes of London, and in the country, but in the course of time, much of the business destined for him fell to the lot of his father's favourites, young Francis North. He went on the Norfolk circuit, which brought him into the neighbourhood of the family and brought him the opportunity to let his character be known, and it soon seemed likely to aid him slip from his hands.

'The lord kept by his brother, Roger North, is one of the simplest developments of private life and habits during the seventeenth century which our literature possesses. We are let into all the hopes and fears of the young aspirant—his paucity and dishonest tricks, his gracelessness, much coarseness, his trilling politics, and his readiness to do any work that persons well intrenched in power might set before him. The book is all the more curious because its author never, even in his later years, devotes himself to political work; but watches as that patient perseverance in well doing which finally brought him what he practised them to solid honour and wealth. Standing between a Shaftesbury and a Jeffreys, North's character has a particular charm, a kind of romantic touch, something unanswerable, and perhaps the honest indignation which his character has elicited from Lord Campbell seems rather disproportionate when the nature of the times is considered. The man is particularly instructive in describing his attempts to obtain a rich wife, bestowing hearty commendation on the skill and intrepidity with which he foiled every effort to ally him to anything under the desired standard of wealth. Other qualifications apper to be of small concern. One of his negotiations is thus told:—There came to him a recommendation of a lady, who was an only daughter of an old weaver of Gray's Inns, supposed to be a good fortune in present, for her father was rich: but, after his death, to be worth nobody could tell what. His lordship got a sight of the lady, and did not dislike her: thereupon he made the old man a visit, and a proposal of himself to marry his daughter. There appeared no symptoms of a bargain; but the old gentleman asked him what estate his father intended to settle upon him for present maintenance, jiuseure, and provision for children. This was an insidious question, for it was plain from the father's manner that he was at present not a man of any establishment, and one would be to spare for him. Therefore he said to his worship only "that when he would be pleased to declare what portion he intended to give his daughter, he would write to his father and mention his offer. And so they parted, and his lordship was glad of his escape, and resolved to give that affair a final discharge, and never to come near the terrible old fellow any more. His lordship had at this time the advice of a friend, who says, 'tis a princely bounty of your blessed hand (most gracious Sovereign), comforting and supporting my poore old decayling life, of right challenging the travel of my study, the labor of my body, and the prayer of my devotions, to be wholly employed for your Highness, and alsoother devoted to your service.'

(North's Bibliotheca Britannica; Biographia Universelle, article Doni.)

North, Francis, Baron Guildford, lord keeper of the great seal of England, the immediate elder brother of the following, was born, as Lord Campbell has discovered from the inscription on his tomb-stone, on the 22d of October, 1674. He was admitted fellow-collegium of St. John's College, Cambridge. He afterwards became a member of the Middle Temple. He passed his time gravely and studiously, and appears early to have resolved not to leave any plan untried, whether by his own strength, time, and labor, or by the advice, wealth, power, and distinction of his friends. His relaxation consisted of music meetings, hearing Hugh Peters preach, and occasional convivial sallies with fellow-students—very small items of dissipation, the nature of the times and the habits of the young
flourished, being, instead of vacation in term, rather term in vacation, so large was the increase of trials by misprin out of the court, as also of motions and pleas in the court. These struggles are well known to have had great influence in the practical extension of the jurisdiction of the three courts of Westminster Hall, Middle Temple, and Inner Temple, by the late great dabbled with to lose sight of his own ultimate interest. Knowing that, from the difficulty felt by the king in obtaining payment of the large sums he had spent, the new keeper should have no salary beyond the fees of his office, and conscious that he was the only person who had at that juncture a substantial claim on the appointment, he refused to touch the seals until, "for his majesty's honour," they were accompanied by a pension of 3,000l. A year as a judge, he was almost invariably in favour of the prerogative, and seldom if ever endangered his influence at court by his independence. A bold and a still more arduous instrument of power was however gradually undermining him in his latter days in the person of Jeffrey's, whose ascendancy and presumption seem to have completely broken the spirit of the lord keeper. His military and political career shows that he had not been side-tracked with the crudities of Jeffrey's campaign; but Lord Campbell, in a comparison of dates, finds that the lord keeper's death occurred at too early a period in the history of the massacre to allow of his having been a Jacobite. He died on the 9th of September, 1685. He was, in private life, a moral man even for an ordinary age, and a miracle in the reign of Charles II. On his professional merits, Lord Campbell speaks of the bequest of his peers, and the state contained, but he was incapable of taking an enlarged and commanding view of any subject. (North's Lives of the Norths; Campbell, Lives of the Chancellor, ii. 495.)

NORTH, SIR DUDLEY, the third son of Dudley, Lord North, Baron of Kennington, was born on 16th May 1641. In childhood he was lively and active, and having strayed from his father's house, he was discovered sleeping with a woman of bad character, and with difficulty recovered. He made little progress in literary education, and his brother and biographer tells us that he had a strange bent to traffic, and while he was at school, drove a subtle trade among the boys by buying and selling. In short, it was considered that he had learning enough for a merchant, but not phlegm enough for any sedentary profession, which judgment of him was made good by the event.

Being 'boused' to a Turkish merchant upon the ordinary terms to be sent abroad, he was sent as supercargo to Archangel and Smyrna. He left an animated and curious journal of his voyage to Archangel, and his subsequent progress by Italy to Smyrna, where he resided and traded. He dedicated the work to the public and to the nation, and was the author of a book on the education of a scholar, but it is full of amusing descriptions and sagacious remarks. After a residence for some time in Smyrna, where he suffered from disease, he removed to a factory at Constantinople under King Charles II. He returned home in 1678, and in 1680 he said "that for scolding and railing it was more apt than any other language." He left some curious information about Turkish manners, particularly as to the administration of justice, with which he had some practical experience. His experience and observations are generally printed in his memoir as he wrote them; but on some occasions, when his brother professed to render them in his own language, the biographer being a practising English barrister, makes a singular jumble of the Turkish administration by putting his allusions to it into the technical phraseology of the English law.

Very few dates are given in his biography, but it is stated that Dudley was on his way home having touched at Smyrna, left that place on 28th March 1680. He wrote, as long a journal of his return journey, A Voyage from Smyrna, with an Account of Turkey, containing matters little known in Europe, left unfinished. He spent his latter years in London. Soon after his return he was chosen sheriff, and knighted by the Lord Mayor, and was admitted to the inner chamber of the Exchequer. By the interest of his brother, the lord keeper, probably as much as by his own merits, he was made a Commissioner of the Customs. Towards the end of the reign of Charles II. he was made a bailiff of Rotherhithe, and then one of the Victuallers of Rathbone Place. By the interest of the new keeper, the lord keeper, probably as much as by his own merits, he was made a Commissioner of the Customs. The life of the second of the reign of Charles II. he was made a tax collector in the City of London. In the reign of William and Mary, he was the first man in the Custom House. He died in 1692, and was buried in the church of St. James's. He was set back to his office in the Customs. He made himself somewhat unpopular in his office by suggesting a tax on sugar and tobacco. In the mean time he had been chosen member of Parliament for Banbury, and took considerable interest in politics, with, apparently, a far more independent spirit than his brother, the lord keeper. His biographer relates for him the merit of having offered resistance to the king under the excitement of the "clawing." He lost his office at the Revolution, and was subjected to a great deal of pain and hardship. His imprisonment on account of his examination by both Houses of Parliament. He died on 31st December, 1691. (North's Lives of the Norths.)

NORTH, ROGER, the sixth son of Dudley, Lord North, was born about the year 1680. He studied in the Middle Temple, and became a member of the court of Archbishop Sheldon. It is stated in Reece's Cyclopaedia that he was Attorney-General under King William III. He is mentioned in the list of Attorney-Generals in Butter's Political Index. He died in 1783. He left, in manuscript, some Memoirs of Music, which met with approbation from Dr. Burney. In 1740, a quarto volume was published called Examinen, or an Enquiry into the Credit and Veracity of a pretended complete History, showing the perverse and wicked design of it, and the many Fabuluses and Absurdities of Truth contained in it, together with some Memoirs occasionally inserted, and tending to vindicate the Honour of the late King, Charles II., and his happy Reign, from the intended Aspersions of that foolish Pen. The work against which this volume is leveled is Poussier's 'Compendium of Music,' and it is a partizan object, much insight may be had into the state of society and politics during the reign of Charles II., by a personal of the Examinen, and when measured by a higher tone of independency, it is evident that the simplicity, which this partizan object, much insight may be had into the state of society and politics during the reign of Charles II., by a personal of the Examinen, and when measured by a higher tone of independency, it is evident that the simplicity, which this

(Article by Burney, in Reece's Cyclopaedia; Collina's Paege: Works referred to.)

NORTHUMBERLAND AND INLET, is a large bay on the eastern coast of North America, running nearly parallel to Davis's Strait and entering the continent to a distance of more than 150 miles from the open sea. Its entrance lies between 64° 36' and 63° 50' N. lat., and 68° 10' W. long. It extends in a north-western direction with a width varying between 40 and 50 miles to the north of 66° N. lat., where it begins to grow narrower, and it terminates in an inlet not more than three miles wide, where the latitude is 66° 30' to 67° N. lat. Though by its geographical situation this bay appears to be placed without the general course of the icy masses, which during the summer are met with along

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the coast of this part of America, the prevailing southerly and south-easterly winds, and the tides, which rise to twenty-five feet and more, bring during that season large masses of floating ice into the bay, which circumstance renders its navigation rather difficult. The country along the shores of the inlet is very rocky, and in the vicinity of the ocean mountainous. Near the western shores is Mount Hecla, whose summit rises to 2000 feet above the sea-level, being to an estimate. Farther inland the country appears to be less elevated. The shores of the bay, especially on the western side, are beset with numerous rocky islands and cliffs. It does not appear that this inlet is much visited by whales; nor are other fish abundant. But as it is pretty well peopled by Eskimaux, wild animals probably are numerous. The Esquimaux have also several stations, at which great numbers of salmon are caught. This inlet was first explored or discovered in 1641 by Captain Wareham.

(London Geographical Journal, vol. xii.)

NOSOLOGY, (from ουσα and μελες), is the term applied to the classification and arrangement of diseases. It was early found in the observation of the symptoms of disease, that many of them recur again and again, and this led to the assigning to such groups of symptoms particular names. Thus we find that the term fever was early applied to designate a certain set of symptoms, and, as any of these symptoms preponderated, the fever obtained a specific name, as putrid fever, pestilential fever, etc. But not only were symptoms had recourse to for the purpose of distinguishing peculiar forms of fever, but the causes and the locality were frequently employed; thus marsh, jail, hospital, and other fevers have been described. In this way the various were early accumulated for the formation of a system of nosology. It was, however, still comparatively modern times, that anything like a scientific system of arrangement was proposed. One of the earliest of these was that of Sauvages, who, taking the most prominent symptoms of diseases as his guide, divided them into ten great classes which he named Vitia, Feberas, Phlegmasia, Spasmi, Anhelationes, Debilitates, Dolores, Vessanum, Fluxus, and Cachexia. Under these classes were arranged various orders: thus, under the first class Vitia, he arranged the orders, Maculae, Efflorescentia, Phymata, Excrecentia, Cystides, Ectopia, Plague. The order Maculae was divided into the diseases Leucoma, Vitilego, Ephelis, GuTa rosea, Naurus, and Ecchymosa. This classification of diseases was followed by those of Linnaeus, Vogel, Sager, and Macbride, but in their arrangements they all recognized the same principle of classification as Sauvages, and made their division of diseases to depend on the greater or less prominence of particular symptoms. All these systems, were, however, supplanted by that of Cullen, which he promulgated in the second edition of his "Synopsis Nosologicum Medicinae." The following plan will give an idea of its structure:

### CLASS I.—PYREXIAE.

<table>
<thead>
<tr>
<th>Order I.</th>
<th>22 Odontalgia</th>
<th>23 Podagra</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEKKER.</td>
<td>24 Anthropus.</td>
<td></td>
</tr>
</tbody>
</table>

#### § 1. Intermittentia.

1. Tertiana
2. Quadra
3. Quadrinaria

#### § 2. Continentia.

4. Synoche
5. Typhus
6. Synochus

### ORDER II.

<table>
<thead>
<tr>
<th>PHEGMASTIS.</th>
<th>25 Varicola</th>
</tr>
</thead>
<tbody>
<tr>
<td>26 Varicia</td>
<td></td>
</tr>
<tr>
<td>27 Rubecula</td>
<td></td>
</tr>
<tr>
<td>28 Scurtina</td>
<td></td>
</tr>
<tr>
<td>29 Pestia</td>
<td></td>
</tr>
<tr>
<td>30 Erygias</td>
<td></td>
</tr>
<tr>
<td>31 Militia</td>
<td></td>
</tr>
<tr>
<td>32 Uricaria</td>
<td></td>
</tr>
</tbody>
</table>

### ORDER III.

<table>
<thead>
<tr>
<th>23 Pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>24 Pneumonia</td>
</tr>
<tr>
<td>25 Pneumonia</td>
</tr>
</tbody>
</table>

### ORDER IV.

<table>
<thead>
<tr>
<th>35 Epistaxis</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 Hemorrhagia</td>
</tr>
<tr>
<td>37 Hemorrhoidis</td>
</tr>
<tr>
<td>38 Menorrhagia</td>
</tr>
</tbody>
</table>

### ORDER V.

<table>
<thead>
<tr>
<th>6 Hepatitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 Splenitis</td>
</tr>
<tr>
<td>8 Nephritis</td>
</tr>
<tr>
<td>9 Cystitis</td>
</tr>
<tr>
<td>10 Enteritis</td>
</tr>
</tbody>
</table>

### ORDER VI.

<table>
<thead>
<tr>
<th>11 Apathenia</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 Melitana</td>
</tr>
<tr>
<td>13 Paraphla</td>
</tr>
<tr>
<td>14 Peptidum</td>
</tr>
<tr>
<td>15 Staphylum</td>
</tr>
<tr>
<td>16 Sarcinum</td>
</tr>
</tbody>
</table>

### ORDER VII.

<table>
<thead>
<tr>
<th>17 Pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>18 Pneumonia</td>
</tr>
<tr>
<td>19 Pneumonia</td>
</tr>
</tbody>
</table>

### ORDER VIII.

<table>
<thead>
<tr>
<th>20 Pneumonia</th>
</tr>
</thead>
<tbody>
<tr>
<td>21 Pneumonia</td>
</tr>
</tbody>
</table>

### CLASS II.—NEUROSES.

<table>
<thead>
<tr>
<th>Order I.</th>
<th>51 Epilepsia</th>
</tr>
</thead>
<tbody>
<tr>
<td>CORAST.</td>
<td>52 Palpitation</td>
</tr>
<tr>
<td>53 Anxia</td>
<td></td>
</tr>
</tbody>
</table>

| 41 Apoplexia |
| 42 Paralyxia |
| 43 Paralyxia |

### ORDER II.

| 54 Dystonia |
| 55 Pertusis |
| 56 Pyrosis |
| 57 Celia |

### ORDER III.

| 58 Cholera |
| 59 Diarrhhea |
| 60 Diabetes |
| 61 Hysteria |
| 62 Hypochondria |

### ORDER IV.

| 63 Hepatitis |
| 64 Melancholia |
| 65 Mania |
| 66 Undrolydia |

### CLASS III.—CACHEXIAE.

<table>
<thead>
<tr>
<th>Order I.</th>
<th>75 Hydrocrachitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>MARORES.</td>
<td>76 Hydrocrachitis</td>
</tr>
<tr>
<td></td>
<td>77 Asctis</td>
</tr>
<tr>
<td></td>
<td>78 Hydrometra</td>
</tr>
<tr>
<td></td>
<td>79 Hydrocholia</td>
</tr>
</tbody>
</table>

#### § 4. Solida.

| 67 Tubas |
| 68 Atraphia |

### ORDER II.

| 80 Physconia |
| 81 Rachitis |

#### § 1. Adipose.

| 82 Flatusosa |
| 83 Serofulia |
| 84 Syphiillis |
| 85 Scorbutus |
| 86 Elephantiasis |
| 87 Hystericus |
| 88 Cruralis |
| 89 Aparasites |
| 90 Anoxia |
| 91 Apathenia |

### ORDER III.

| 92 Urethra |
| 93 Gonorrhoea |

### ORDER IV.

| 120 Obstipatio |
| 123 Dysuria |
| 124 Urethritias |

### ORDER V.

| 125 Aparasites |
| 126 Anoxia |
| 127 Varix |

### ORDER VI.

| 128 Echinoma |
| 129 Scrobiis |
| 130 Cancer |
| 131 Bellus |
| 132 Sarcomata |
| 133 Verruca |
| 134 Chelus |
| 135 Lupus |
| 136 Ganglium |
| 137 Hydatis |
| 138 Hydroura |
| 139 Exostosa |

### ORDER VII.

| 140 Hernia |
| 141 Prolapos |
| 142 Lezatio |

### ORDER VIII.

| 143 Vularis |
| 144 Ulcus |
| 145 Herpes |
| 146 Tinea |
| 147 Poena |
| 148 Fructura |
| 149 Caries |
It was the simplicity of this system which recommended it to goers and to numbers of numerals; for it has a great influence over other systems of pathology. At the same time it will be seen that this and the previous systems are purely artificial, and frequently bring together diseases of different kinds, on work of Boethius, particularly in those on music, and they seem to have obtained universal currency in the middle ages by means of the work of Boethius. The study of music was also led to the impression that diseases have a character as definite as the objects of natural history, and that a species in one area be as easily defined as the species of another. But it becomes evident, after a little. It is with the exception of those diseases that depend upon specific contagion, no part of the idea of a species as applied to plants or animals can be made use of to designate particular diseases.

With the knowledge of pathology and pathology, many attempts have been made to give a natural arrangement of diseases than that of Cullen. Dr. Mason Good divided diseases into the following six classes:

- **Class I.** Catarrh. Diseases of the digestive functions.
- **Class II.** Pneumatics. Diseases of the respiratory function.
- **Class III.** Haematia. Diseases of the sanguineous function.
- **Class IV.** Neuromata. Diseases of the nervous function.
- **Class V.** Genitae. Diseases of the sexual function.
- **Class VI.** Eclipsia. Diseases of the excretory function.

This system, however successful it may be regarded in its primary divisions, was too technical in its details to be very generally acceptable. The system of natural classification founded on pathological distinctions is that of Pinel, who divides diseases into fevers, inflammations, hemorrhages, neomias, and organic affections. The great object of Pinel's so-called natural classification was to give knowledge of the functions of many parts of the human body, whilst the symptoms of diseases, being very evident, led to the assumption of causes of disease and pathological states which probably do not exist.

(Cullen, *Systema Nomenclatura Medicinae*)

NOSTOC [Zoogaptes, P. C.]

NOTODANUS, a genus of fossil fishes from the lant of Dorsetshire. (Agass.)

NOTITIANUS, a genus of fossil fishes from the chalk of Kent. (Agass.)

NOY, WILIAM, a lawyer, whose professional career had a considerable influence on British History, was born about the year 1577. He was, says Fuller, for many years, the strongest champion of the subjects' liberties, until King Charles entertained him to be his attorney. He was made Attorney-General on 31st October, 1631. He had for some years been member of Parliament, first for Helston, and subsequently for St. Ives. He was a profound lawyer and juridical antiquity; but, as Clarendon says, he could not give a clearer testimony that his knowledge in the law was greater than all other men's by making that law which all other men believed not to be so. It was to his researches in the profound and subtle abstractions of common law, and to his clear, rare spirit, that the court owed the project of ship-money. Noy drew the writ for levying this illegal tax, but he did not live to see the momentous effects of his exertions, and died on 6th August, 1676. It was noted in the journals of the day, that the death of Noy deprived the King of a valuable lawyer. The judge of the King's Bench, when answering a question upon the Rights of the Crown; declaring how the King of England may support and increase his annual revenues, 1715, 8vo. He collected Reports and Cases taken at the time of Queen Elizabeth and James I. Author of the book: *The Compleat Lawyer.*

**NUCLEUS, [Scott, P. C.]**

**NUMBER, [THOMAS, P. C.]**

**OLD APPENDICALES OF.** The student of books viewing on the middle ages will occasionally meet with some designations of numbers, or rather of the ratios of numbers, which have descended, which have descended from numbers of a theological character, and they should be utterly lost sight of, for they form a dark background on which the merits of Sacrobosco, Bradwardine, Niels., II. - 3 B

*With numbers of*
NUMBRN.AS, THEORY OF. We are here to apply an omission in the article on this subject, or rather in filling up the table of the nation which were made for the previous one. Euclid's geometry, assuming only the use of his three celebrated postulates, enables him, a linear unit being given, to construct the length represented by any algebraic expression which involves only additions, subtractions, multiplications, divisions, extraction of the square roots, or combinations of all these. But a cube or fifth root is beyond the power of the system. Again, from the theory of equations it is soon made obvious that the solution of the equation $x^2 - 1 = 0$, and the division of a circle into $n$ equal parts, are one and the same problem. One solution of the preceding is $x = \cos \theta + \sqrt{-1} \sin \theta$, where $\theta$ is the nth part of four right angles. [Boor, P. C.] Euclid, in his fourth book, shows how to cut a circle into equal parts; and analysis shows that the sines and cosines of the angles so involved can be obtained by formulae which involve no roots except the square. But except into halves, thirds, fifths, or sevenths, or parts obtainable from these by one or more bisections, Euclid was not able to cut a circle into equal parts.

So the matter rested for about 2000 years, until Gauss, in his 'Disquisitiones Arithmeticae' (1801), not only pointed out how to extend Euclid's conclusions, but also in a manner how to account for them. The statement of his results, even when they are instructive to the learner, and we shall give it accordingly: referring for the demonstration to the works of Gauss or Legendre [Numbers, Theory of, P. C.], or to Murphy's 'Theory of Equations.'

The expression $a + \sqrt{b}$ and $a - \sqrt{b}$ being rational, is the solution of a quadratic equation with rational coefficients. But if $a$ and $b$ themselves have the form $c + \sqrt{d}$, in which $c$ and $d$ have the same form, and so on; then $a + \sqrt{b}$ is the solution of a quadratic equation in which the coefficients are themselves the solutions of the quadratic equations, whose coefficients are again the solutions of quadratic equations, and so on. Consequently, any equation, the root of which is capable of construction by Euclid's postulates, must be reducible to a system of quadratics; and the converse. Now if $n$ be a prime number, $n = 1$ is an even number, and therefore has factors. Let its prime factors be $2, 3, b, c$, &c., and let them several enter $p, q, r, s, &c.$ times; so that $n = 1 = 2^p \times 3^q \times b^r \times c^s$.

Gauss succeeded in showing that when $n$ is a prime number, the solution of the equation $x^n - 1 = 0$, can be made to depend upon the solution of $p$ equations of the second degree, of the $q$th degree, $r$ of the $b$th degree, and so on. Consequently, whenever $2 = 1$ is the only prime factor of $n - 1$, or when $n = 1$ is prime, or when $2^p + 1$ is a prime number, the sevenfold is reducible to the ninefold quadratic equations, and the division of the circle into $n$ equal parts can be accomplished by Euclid's geometry. And further, it is easily demonstrated that $2^p + 1$ can never be a prime number, except when $p$ itself is a power of 2 (2 included) though $2^n + 1$ is not always prime. Nor has it been shown that other divisions are impossible: Gauss's theorem merely points out cases where the thing can be done, without pronouncing the exclusion of others. Gauss, indeed, does assert that he can demonstrate all other cases to be impossible to be constructed by geometry, that is, reducible to quadratic equations: and the thing is highly probable. If we now construct the series $2^2, 2^4, 2^8, 2^{16}$, &c., among which all our chances lie, we have, 5, 17, 257, 55287, 4294967297, &c. The first five are prime numbers: Euclid has disposed of the two first divisions; Gauss has added that a circle can be concentrically divided into 17, 257, and 55287 equal parts. But 4294967297 is not a prime number, being divisible by 641. Euclid's mode of obtaining the division into 18 parts can also be extended.

From $a$ and $b$ we get $\frac{a + b}{2}$ by their difference, as in Euclid; and thence $a$. From $a$ and $b$ we get $\frac{a - b}{2}$, and thence $b$. From $a$ and $b$ we get $\frac{a + b}{2}$, and thence $b$. Consequently the circle is divisible geometrically into the following numbers of equal parts.

$$\frac{a + b}{2} \quad \frac{a - b}{2} \quad \frac{a + b}{2} \quad \frac{a - b}{2}$$

NUTRITIA. [COPYS, P. C.] NUTRITIA is a genus of Trilobites, from the Silurian strata of Tyrone. (Fortlock.) It occurs also in England and Wales.

NYCTERIBIA, a genus of parasitic insects of the order Diptera. They are closely allied to the horse-flies (Hippoboscis) which have neither wings nor balancers. Their intermediate legs are connected at the base by a pair of comb-like organs composed to represent wings. They live on the bodies of bats.

NYPHMAEA. [WATER-LILY, P. C.]
OATMEAL. [Avey, P. C. S.]

OBLIQUE ARCH. [Skeew Bridge, P. C.]

OBEQUESUS, JULIUS, the author of a small work in Latin which is entitled 'De Prodigis.' Nothing is known about the author. Scaliger concludes that Obequensis lived before Hieronymus, because Hieronymus in a particular passage appears to have copied a fact from Obequensis. This passage of Hieronymus was written in the time of Valens, who died a.d. 379. The work of Obequensis is a record of wonderful things that happened during the period from the foundation of Rome to the time of Augustus. The first part of the work is lost, but it has been supplied by Lycoctonos, whose supplement commences with the time of Romulus and extends to the year of the City 568, when the extant work of Obequensis begins. There are various gaps after 568, which Lycoctonos has also supplied. The method of the author is to enumerate the wonderful occurrences under any given year, and then to state what happened thereon. The following is an example: (No. XCI.)—'It rained milk on the Grecostaisia. At Croton a flock of sheep with a dog and three shepherds were killed by lightning. At Saturn a calves, with two heads was born. There was an uproar in the city owing to Grecusius proposing his laws.' Obequenses chiefly followed Livy, for he uses pretty nearly Livy's words, as appears from a comparison of Obequensis with those parts of Livy which are extant. His work also terminates with an event in the life of Augustus, and from the description of his life, and the history of Livy terminates with the death of Drusus.

Lycoctonos in his preface argues that the attention which the Romans paid to wonderful occurrences and signs proved their religious feeling; their religion is shown by their worship of false deities; and he adds that if they had been acquainted with the true religion, they would have surpassed in religious zeal their posterity, who are Christians rather than heathens, and that the events of the times foretold by Jesus Christ (Luke xxi.) as to happen when the end of the world was approaching. Among the signs then recently witnessed the author mentions three or four eclipses happening in a year, stars with hair (cometes), burning meteors, and earthquakes and convulsions of the earth in Italy, all which made no impression on the people of that day, to such a height of impurity and wickedness were men come. The consequences of all this were pernicious errors, horrible blindness, and persevering blasphemy; and the divine vengeance showed itself in civil wars, strange diseases, and famines. The author thought that an edition of Obequensis would be of some use, and that the portrait is published in the work of Eckhout and Bungea, 


ODOVAERE, JOSEPHUS DIONISIUS, the most celebrated historical painter of the Flemish school of recent times, was born at Bruges, October 3, 1778. He was brought up in the college of the Augustines of that city, and was destined by his parents for mercantile pursuits, though he had always displayed a decided ability for the graphic art. In 1794, in consequence of the French invasion of Belgium, Odoevaere was removed by his parents, and accompanied them into Holland, where he remained fourteen months. They returned to Bruges, and as Odoevaere had a continued dislike to a mercantile pursuit, he was placed in the Academy of Bruges, in which he obtained the first prize for drawing in 1796. He went, towards the close of the following year, to Paris, and studied in the school of his fellow-townsmen Suvee until he was appointed director of the French Academy at Rome, in which he obtained the first prize for drawing in 1804. He obtained the grand prize of the French Academy of Painting, for a picture of the death of Phocion, and had the honour of being presented to the emperor. He returned in the same year to Bruges, and in 1805 he went as a pensioner of the French government to Rome, but he remained there together eight years, and experienced the regulation of the French government, he sent, after his residence of five years in Rome, an historical picture to the French Academy; the subject was the Coronation of Charlemagne; and it was received with approbation. He was then appointed a commission in Rome to paint two large frescoes for the palace of Monte Cavallo, but political events which followed prevented the execution of these works. He left Rome at the close of 1812, and returned to Paris, and obtained the gold medal for a picture in the exhibition there. He returned finally to Bruges, where he executed several public and private commissions. In 1814 he established himself in Brussels, where he painted his pictures of the Peace of Utrecht, and the Battle of Waterloo at the moment the Prince of Orange was wounded, for the King of the Netherlands, who had created Odoevaere his own painter in the spring of 1815. The Battle of Waterloo was exhibited in 1817 and 1818 in many of the provinces of the Netherlands, together with a portrait of the Prince of Orange, which is engraved by Lignon, and a picture of Brumante introducing Raphael to Julius II. Odoevaere was the commissioner appointed on the part of the Netherlands to reclaim the pictures which had been taken by the French from Paris, in the collections of the King of Holland and Belgium. In the completion of this commission, the King created him a Chevalier of the Lion of the Netherlands, and several Flemish cities presented him with medals struck expressly in commemoration of the restoration of their respective liberties.

The Battle of Waterloo was followed, in 1820, by the Battle of Nieuwpoort, and a Narcissus, engraved by Vlamynck. In 1821 he exhibited at Brussels his Triumph of Cimabue: a work executed subsequently to a commission in his studio: the establishment of the Power of the House of Orange; the Inauguration of the King at Brussels in 1815; besides others from classical history, and many scripture-pieces for various churches in the Netherlands, in some of which are excellent altar-pieces by Odoevaere. He died at Brussels, in February, 1850, not having completed his fifty-second year. Van Eynden and Vander Willigen, in the third volume of their 'National History of Painting since the Middle of the Eighteenth Century,' published in 1820, have given December 2, 1775, as the date of Odoevaere's birth, which is corrected in the fourth volume of appendix, published in 1840, to the date given above. His portrait is published in the work of Eckhout and Bungea, "Portraits des Artistes modernes," etc., Brussels, 1829; and several of his works are engraved in the "Annales du Salon de Gand"—as the Coronation of Charlemagne; the Confession of the Duke of Saxony; and the Death of the Prince of Nieuwpoort. Some of the pictures of Odoevaere are of very large dimensions. He was a member of the Academy of St. Luke at Rome, and of several other institutes of the fine arts.

R. Van Eynden en A. Van Der Willigen, Geschiedenis der Nederlandse Schilderken, zedert de hefst der xvii. Eeuw, Amsterdam, 1842.)

ODOVNIETER (from ides, a road, and μετρον, a measure) is an instrument used for measuring the distances passed over in travelling, and is very nearly the same as that which is called a Pedometer; the latter is carried in the pocket of a person on foot or on horseback, and the former is attached to a carriage. (Pedometer: "OECUMENICAL COUNCILS. [COUNCIL OF THE CHURCH, P. C. S."

IZEDEMA, a genus of beetles belonging to the third family of heteromorph Colocerata, the Spherinae. Genothiera, a genus of plants belonging to the natural order Onagraceae or Onagraceae. It has a 4-cleft calyx, 4 petals, a filiform style, with a callos or crumiform stigma, linear capsules of 4 cells, with a long aril. C. binenis, Evening Primrose, has ovate lanceolate flat- toothed leaves, a rough hairy stem, petals longer than the stamens and about half as long as the tube of the calyx. The flowers are large, and abundant in groups at the end of a long stem. It abounds on the Lancashire coast, and covers several acres of ground near Woodbridge, Suffolk. The roots are edible.

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and were formerly taken after dinner to flavour wine as olives now are; therefore the generic name was changed from Osage, the ass-fool, to Olea, the wine-feeder. This plant was
more cultivated for the sake of its tubers, which might in some measure have stood instead of the potato had they not been superseded by the introduction of the latter in this country. This is the only British species in the genus. There are 85 species enumerated for
Don, growing chiefly in North America. They are
handsome border flowers, and deserve to be cultivated, but are not valuable on account of any properties they possess. They will grow in any common garden soil. The perennial
kinds are usually propagated by seed, by dividing the plants at the root, and some of them by cuttings. The seeds of the annual and biennial kinds only require to be sown where the plants are to remain.

(Don, Gardener's Dictionary; Babington, Manual of
British Botany; Burnett, Outlines of Botany.)

OFFERINGS, OBLATIONS, AND OBSESSIONS are
not only those small customary sums paid at Easter, but also the customary payments for marriages, christenings, churchings, and burials. By 2 & 3 Ed. VI. c. 13, 'all persons which by the laws and customs ought to make or pay their offerings, shall yearly well and truly content and pay the same to the parish, vicar, proprietor, or their deputies or farmers, of the parishes where they shall dwell or abide: and that at such four-offering-days as at any time hereafter may be within the space of 5 years, shall have been accustomed for the payment of the same; and, in default thereof, to pay for the said offerings at Easter then next following.' The four offering-
days above spoken of were Christmas, Easter, Whitsuntide, and the dedication of the parish church. It is directed by the rubric, at the end of the Communion Service, that 'yearly at Easter, every parsoner shall reckon with the parish, vicar, or curate, or his or their deputy or deputies, and pay them what was due from them all ecclesiastical duties accustomably due then at that time to be paid.' Easter offerings are due of common right, as well as by custom. (Bunb. 178, 128.)

Thus, in Carthew v. Edwards, Trin. 1749, it was decreed by the Court of Chancery that the Easter offerings were due to the plaintiff of common right, after the rate of 2d. a-head for every person in the defendant's family of sixteen years of age and upwards. But by custom the sum may be more. In London 4d. a-head is usually claimed. By the Small Tithe
Act, 7 & 8 Wm. III. c. 6, offerings, oblations, and obser-
venations may be recovered before justices of the peace.

Surplus-fees are payable for every marriage, christening, or baptism, according to the custom of the parish. Mortuaries are claimed on the death of each person in a parish, according to the value of property left, but not to a greater amount than 10s. (Babington, Ecclesiastical Law.)

OGGIONE or UGGIONE, MARCO DA, a Milanese painter and distinguished scholar of Leonardo da Vinci at Milan about 1490; he was born about 1470, at
Ligorna in the Milanese. He painted in oil and fresco, and is on the whole one of the best of the
Milanese painters. His frescoes of the church della Pace at Milan, which are much praised, are now in Brera at Milan; they were removed from the wall by Barezzi. Oggione is however now chiefly known for his copy of the 'Last Supper' of Leonardo da Vinci, now in the Academy of Arts in London. This copy is painted in oil, and was executed about 1510 for the Refectory of the Certosa di Pavia; and as it was copied when the original was in a perfect state, the now almost total decay of the latter renders it very valu-
able. The opinions regarding its merits are various. Giuseppe Boffi does not wholly approve of it; but as the original has been virtually decayed since 1726, when it was first restored, all subsequent judgments of the merits of the copy with respect to the original must be received with due reservation, as they are certainly the result of individual fancies of what the original might have been, rather than of what it by actual comparison was found to be. Marco da Oggione's copy must be a better criterion of what the original was than the remains of all the critics combined; they have no right to assume a deviation from the original, when they cannot possibly demonstrate it. Oggione made two large copies, both, it is said, now in the Museum, that in oil, in the Royal Academy, and one in fresco for the Refectory of the convent of Castel-
lazzo, which was copied by the Cav. Giuseppe Boffi, though Boffi's picture was taken chiefly from a copy in the Ambra-
sian Library made by Andrea Pannini and Vespinal in

1819, when the original was already much decayed. There is an older copy at Ponte Castrice, made in 1655, and attributed to Pietro Luni. Bossi's copy was made in 1807 for Eugene Beauharnais, viceroy of Italy, to be worked in mosaic; the cartoon is now at Munich, and the mosaic was made from one copy partly from another, from studying other works of Da Vinci, and from the artist's own feeling of Da Vinci's style, is essentially a restoration or translation, and not a copy; it may have no resemblance to the original in foreshortening and composition; and to the true
lover of art can have little value, compared with the old un-
assuming copy of Oggione. The mere fact that Oggione's

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OIL

OIL MANUFACTURE OF. An account of the properties of the more important oils, and of the materials on which they are produced, is given in Oils, Vinegars, p. 417, and in Oils, Vinegars, p. 415, and Oils, Vinegars, p. 417; and further information may be found under the names of some of the principal oils, as Croton OIL, Linseed OIL, and Olive OIL, or in articles which treat on the materials from which oils are made, such as Elaeis, Mandia, Linseed OIL, Olive Europea, Richmon, Communist, and Guacharo Bird. Under Fisheries, also [P. C., pp. 288, 289], is given much information on the production of whale oil. We may here add a few words on the processes of the manufacture of such oils as are of the greatest commercial importance.

The manufacture of animal oils requires very little notice beyond what is given in the articles Oils and Fisheries above referred to. The blubber, or fat from which the oil is pro-
cured, is usually cut into small pieces and packed in casks soon after it is taken from the whale; it is then brought home in a half-frozen state, and is emptied into the oilummy or receiver, capable of holding several tons. From this receiver the decomposing fat is conducted, after settling for a few hours, into a copper boiler, in which the separation of the fluid from the solid is completed by the application of heat. From the boiler the oil flows through a kind of filter of brushwood, which detains the greater impurities, into coolers, from which, when quite cold, it may be drained into smaller casks. Various driers are employed for purifying whale oil and diminishing its unpleasant smell. The quantity of oil obtained is about four-fifths that

(Gran, Storia Pittorica, &c.; Gothé, Propylæum.)

OHMACHT, LANDELIN, an eminent German sculptor, born at Danzig near Rottwill in Württemberg, in 1760. He was the pupil of J. P. Melchior. His first public works were some sculptures for the Kreuzkirche at Rottwill, which still remain in the choir.

His last public work was the good boat of Lavater. In 1790 he went to Rome, where he remained two years, and after his return to Germany he was employed on several important monumental works, which were the most important to his master Rихo, in the cathedral of Lübeck; but his principal works are at Strasbourg, where he settled in 1801. His first work there was the monument of General Desaix, who was killed at Marengo, erected on the Rhine, not far from Strasbourg; Thomas, of which that to Professor Oberlin (1810) is one of his principal works; that to the historian Koch (1815) is likewise much admired. He executed an important document in the new church to Dr. Blessig; another to General Kleber, in the cathedral; and a colossal figure to Adolph von Nassau, in the cathedral of Speyer. There are also several minor works, by Ommacht—A. Hebe; the Judgment of Paris (at Nymphenburg), and others. Among his busts are several of Klopstock, with whom he was intimate. He died at Strasbourg, in 1834; his portrait is in the Vogel collection of portraits in the possession of the king of Saxony. The celebrated sculptor David, upon seeing the works of Ohmacht at Strasbourg, is reported to have said that one could not sufficiently admire them, and that Ohmacht was the Correggio of sculptors.

(Nagler, Allgemeines Künstler Lexicon.)

OIL-PAINTING. [Eyck, John Van, P. C., p. 133; Painting, P. C., p. 142; Oil-Painting, P. C., p. 145; Painting, House, P. C., p. 145; Sturze, P. C., p. 479.)

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of the blubber used. In the South-Sea fishery it is found
advantageous to boil the blubber in water, and whaling vessels,
and to bring home the oil alone in casks. In this process, as
commonly performed, the oil is very imperfectly extracted
from the blubber, and the scum, or solid portions which remain,
are usually thrown into barrels; the nature of which arrangement
the oil that remains in them is not only destroyed, but also becomes,
from its great inflammability, a source of serious danger. To
obliterate these evils some ships are provided with powerful screw-presses for squeezing out
whatever oil may remain after the process of boiling the
blubber, and thus materially increasing the produce. Hebert,
in the 'Engineer's and Mechanic's Encyclopedia,' vol. ii.
p. 476, says: 'After some time the blubber, or thick
press, in which the blubber-scrapes are put into a hollow cy
linder, while yet warm, and compressed by a piston brought
down upon them with a great force. The oil escapes through
holes in the bottom of the cylinder, between which and the
blubber is laid a mattress of wicker-work, to prevent the
blubber from choking the holes. This press is the inven
tion of Mr. John Hythe, of Limehouse.'

Olive oil, as explained under Olea Europaea, in P. C.,
differs from most vegetable extracted oils in being extracted
from the soft fleshy pericarp, whereas such oils are usually
procured from the seeds only. The manufacture is very simple, and
requires little or no power; but writers differ in their accounts of the process, in some im
portant particulars; some stating that the fruit should be
gathered a little before it is ripe, and spread on the floor of a room,
and turned every day until the oil, while still warm, is put
in the volume on 'Vegetable Substances used as Materials of
Manufactures,' in the 'Library of Entertaining Knowledge,' it is
stated on the authority of an English gentleman who had
resided at Gallipoli, where much excellent olive oil is made
intended by the Philippians never gather the olives, but allow them to
drop in their maturity from the tree to the ground. In the
'Dictionnaire de l'Industrie,' published at Paris in 1795
vol. vi. in a section on the manufacture of olive
oil in Provence, however, it is stated that fallen olives should
not be mixed with those which are gathered, for fear of impart
an earthy odour to the oil, and a caution is given against allowing the heap of gathered olives to heat or ferment,
coupled with the remark that the sooner the olives are taken
to the mill the better will be the oil. According to this au
thority, also, all leaves should be carefully removed, as their presence would give a bitter taste to the oil. But Dr. Ure,
in the 'Dictionary of Arts,' &c., p. 898, writing of the same
district, states that it is usual in the neighbourhood of Aix, in
Provence, 'to preserve the olives for fifteen days in barns or cells,
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stones are mounted on the same horizontal axis, but at rather different distances from the central vertical shaft or axis round which they roll, so that they do not follow one another in precisely the same path on the bed of this mill. The bed is surrounded by a rim which prevents the seeds from being scattered by any eccentricity of the running stones. The two running stones are mounted carriers also take rakes or sweeps, which collect and lay the seeds in a ridge along the circular path of the runners. By this means the seeds are reduced, by the partial oil, without loss of the oil. A preparation of from which a limited quantity of very fine cold-drawn oil may be obtained by the simple action of the press.

Owing to the extreme hardness and smoothness of the seeds of cast-iron plates, the circumstance that the fragments of their shells, however broken, form minute concavities which will retain the oil unless a greater pressure be applied than could be given by an ordinary screw-press, the presses employed for extracting oil from such seeds differ materially from those used in crushing olives and other comparatively soft oleaginous substances. Hence it is that the wedge-press and Bramah's hydraulic press have been introduced for the purpose, and that of these two powerful machines some manufacturers prefer the former, believing that the same degree of pressure is more efficient when imparted by means of slender limbs of wood by means of which the pressure is transmitted gradually and steadily as in the hydraulic press. In the wedge-press, of which there are many varieties, the crushed seeds are put into bags of hair-cloth or some similar material, which are placed between plates of iron united together like the covers of a book, or between boards or blocks of wood, within a very strong and massive framework. The small end of a wedge is then introduced in such a way between these plates or boards that when it is driven down by the blows of a ram or pestle, it may compress the bags with enormous force. Barlow, in his 'Treatise on Manufactures and Machinery,' in the 'Encyclopaedia Metropolitana,' in which work (sections 504—515) is much important information on the subject of this article, states that the driving of the wedges is continued until they are so tight that the pestles rebounds from them three times, when attention is paid to the action of the screw. The use of the hydraulic press instead of this apparatus needs no minute explanation. In Barlow's work, just referred to, is an account of such a press which acts horizontally, the bags being, as in the wedge-press, placed vertically, and separated from one another by cast-iron plates; but in Dodd's account, above noticed, of the Walker oil-mill, the bags are represented as piled upon one another in cast-iron cases, and placed in a vertical press. Dodd speaks of the bags in which the seeds are contained as of flannel, and Barlow as of woolen, 'unfolded (enfolded?) by horse-hair mattresses, enclosed in leather wrappers.' The last-mentioned writer states that the first operator of this machine was constructed at Bremen, in 1821, and that its proprietor is satisfied of the superiority of the plan to any other then in use. Among other advantages it is stated that the hydraulic press requires no stamping, as the seeds could do the same work, and that the hairs and bags are found to last longer with it than with the old machine. Since the above date the Bramah press has been successfully applied in the manufacture of cocoa-nut oil, and several presses have been exported to Ceylon and other places for that purpose. Mr. John Hall, of Dartford, patented in 1829 an ingenious oil-press in which the power of a steam-engine or other prime mover is applied through the medium of cams or eccentric rollers; but Barlow states that the plan has not been generally adopted.

We have hitherto spoken only of the extraction of the oil. The means employed before pressing is however necessary for obtaining the principal supply of oil. The precise order of the several operations, as well as the nature of the machinery employed, differs in different places. In the pressings by Barlow the oil-cakes, or solid contents of the bags, which remain after the first cold pressing, are taken out of the bags, broken to pieces, and put into mortars to be pounded by pestles with water. 'There,' he says, 'the pattern is again broken down, and the parestchyma of the seed reduced to a fine meal; thus free egress is allowed to the oil from every vestige in which it is contained, but it is now rendered more serviceable by being passed through a strainer, and even of the fine parts of the meal.' When sufficiently heated it is removed to a chamber, or circular copper pan, in which, while it is kept continually stirred by machinery, it is heated to about the temperature of melting beeswax, either by a charcoal fire, or, according to a more recent practice, by steam. It is then, while hot, put into the bags and subjected to a second pressing; and in some cases the like operations are repeated at least a second time. A second press of inferior quality, is produced. Sometimes the produce of oil is increased by mixing a little water with the paste; but this process is considered to impair the quality of the oil. The oil-presses from Mosop, in particular, which have no other employment than extracting oil from the cakes which they purchase from the French and Brabanters, after passing the process of their mills; a clear indication of the superiority of the Dutch practice.' In some of the Dutch mills, we learn on the same authority, the produce is increased by the application of moderate heat during the grinding process, by enclosing a little furnace in the bed upon which the running stones roll; but it is observed that 'the utmost care is necessary to prevent the heat from becoming too considerable, as it causes the oil to dissolve too much of the fermentable substance of the seeds and exposes it to the risk of soon growing very rancid. When the heat is kept out of the process of grinding may be facilitated by the addition of a little water. The oil produced by the above process needs little further treatment, as the same is unseparated, as it is delivered by the Dutch manufacturers, the parenchymatic part, which inevitably passes away with the oil in some degree in the operation of pressing, will gradually subside, and the oil may be drawn off at very small loss. In drying, great care must be taken, as the bottom being at length removed to a drier and narrow cauldron, where it should be left a considerable time for the dregs to subside.

Linseed oil is used principally as a vehicle for mixing oil-colours for painting, but it is also valuable in several branches of manufacturing industry, and, in a refined or purified state, in some medicinal preparations. Being a fat or oil, it does not easily evaporate, but it is a great inconvenience in some purposes in painting, it is sometimes converted into drying oil by boiling it with sugar of lead, white vitriol, red lead, or other substances which possess similar properties. The common kinds of drying oil are generally known by the name of boiled oil.

Very full details of the improved modern machinery used in the manufacture of oil from seeds are given by Barlow, in the work above quoted, in Dr. Ure's 'Dictionary of Arts, and in the Supplement to that work; and some ingenious processes of simpler character are described in Hebert's 'Engineer's and Mechanic's Encyclopedia;' and in both of these works additional details of the construction of these apparatuses are given, to which the generally important character. The process of making castor oil is detailed under Richius COMMUR, P. C., p. 5, 6.

O'KEEFE, JOHN, was born at Dublin, on the 24th of June, 1747, his father being a man of some consequence in the city, when only six years old, under the charge of Mr. West at the Royal Irish Academy; and his literary education, in Greek, Latin, and French, was received from Father Austin, a learned Jesuit, and his family being Roman Catholics. Two years of his youth, beginning when he was about fifteen, were spent in London with an uncle. From early boyhood he had dabbled in versification; at the age of sixteen he had composed a comedy, and when he was no more than eighteen another comedy of his was brought out by Mossop, at the Smock-alley Theatre in Dublin. His dramatic turn now took entire possession of him. He obtained an engagement at Mossop's Theatre as soon as he was of age for some years to be a member of the company; acting both in Dublin and in other towns of Ireland. At the same time he exercised himself in dramatic writing, often producing small pieces for his own benefit, and on other occasions. In 1747 he married a daughter of Mr. Heaphy, proprietor of the Theatre Royal in Dublin, by whom he had three children. Domestic disagreements arose: after seven years of union Mr. O'Keefe left her, taking her daughter with him, and in 1771, on his separation from his wife, he removed to London; and he never again visited his native country. From that
time he was a play-writer by profession. The greater number of his performances appeared at the Haymarket; but he wrote frequently also for Covent Garden under the management of Harris. His dramatic career may be said to have closed in 1788, after which date no new play of his is known to have been written. But his labours were a collection of dramatic pieces, amounting, on his own list, to no fewer than sixty-eight, of which fifty-six were acted, and many of these with great success. Some of them still keep possession of a substantial literary reputation. His works are mere farce; but the best of them have a flow of spirits, a kindness of feeling, and a richness of whin and eccentricity, which account adequately for the popularity they so long enjoyed. They were composed in circumstances calling for much indulgence. They were the constant efforts of a very poor man to preserve himself and his children from beggary. And, further, from his twenty-eighth year, when a neglected cold brought on inflammation of his eyes, he suffered under a gradual decay of sight, which speedily made reading and writing alike impossible. He was never entirely blind; but for many years he could do little more than distinguish light from darkness.

In 1780, Mr. Harris gave him a benefit at Covent Garden, at which he himself appeared, and the money realized in the subscription and the receipts was enabled to spend 800l. in purchasing a small annuity. In 1803 he received a life-annuity of twenty pounds from Covent Garden, nominally as the purchase-money of his drama still unprinted; but this annuity ceased to be paid in 1826. In 1806 he began to receive a pension from the Crown, to which another pension of a hundred guineas was added in 1826. From these combined sources he was, during the last years of his life, supported in an income little exceeding two hundred a-year; and, in an honourable spirit of independence, he refused a donation sent him by the Literary Fund Society. In 1836 he published 'Recollections of the Life of John O'Keeffe, written by himself.' two volumes 8vo. In 1828 he removed from the neighbourhood of London to Southampton, and there resided thenceforwards, attended by a daughter, who was his only surviving child, his eldest son, a clergyman of the Church of England, having died of the yellow fever at Jamaica, in 1804. O'Keeffe himself was a Roman Catholic to the last. He died at Southampton, on the 4th of February, 1838. In 1834 appeared a small volume of elegies, 'To the Baron Zach, and to Lady Leggatt, addressed to his Daughter,' and prefaced by notices of his character and domestic circumstances.

OIBER, HENRICH WILHELM MATHIAS, an able astronomer and mathematician of Germany, was born October 11, 1768, at Arbergen, near Bremen. Of his private life few particulars have yet been made public; and almost all that can be stated respecting the history of this celebrated person is contained in isolated notices relating to his discoveries in the heavens. He studied medicine at the University of Göttingen, and, during all his life, his time appears to have been divided between the exercise of his profession and his astronomical researches: it is said that, in 1830, he celebrated, by a public festival, the fiftieth anniversary of his medical labours; and his observatory is described as the most complete of those which, at the time of its latest existence, existed in Germany. It consisted of three rooms in the upper part of the house, which was situated in the heart of Bremen: three great windows in the south front gave a view of the heavens almost to the horizon on that side, and one in a closet enabled the observer to look towards the north: openings in the ceiling and roof permitted observations to be made near the zenith. Oibers possessed a five feet achromatic telescope, with a position micrometer by Dollond, and a reflecting telescope of equal length by Schröter: he had also, an astronomical clock by Karsten, a quadrant by Bird, and a reflecting sextant by Troughton, but he had neither a transit instrument nor a mural circle; and, apparently, he determined the time by extra meridional altitudes. Attached to the observatory was an astronomical library containing, among other valuable works, an extensive collection of documents relating to cometography: this library was, after the death of Oibers, presented to the university of Breslau, and deposited in the observatory of Pulkowa.

Dr. Olbers wrote but little on the subject either of medicine or astronomy; but, in 1780, he printed a thesis entitled De Oculi Musculorum Motibus, in which he shews how the eye accommodates itself to the different distances of objects from it by means of a variable action of the muscles, in consequence of which changes are produced in the convexity and the focal length of the cornea; and in 1829, he published in the Annuaire du Bureau des Longitudes a memoir entitled 'De l'influence de la lune sur les saisons et sur le corps humain.'

In 1779 he became known to astronomers by a series of observations which he made on the comet of that year, and by his determination of the elements of its orbit: the computations were founded on a method which had been given by Euler: but, not satisfied with this, he applied to a new method of calculating the orbits of comets from three observations, which, with respect both to facility and accuracy, he considered as having great advantages over the methods before in use. An account of this method, with a preface by the Baron de Zach, was published at Weimar in 1797. It is entitled Abhandlung über die leichteste und bespanneste methode die Bahn eines Cometen aus einem Beobachtungen zu berechnen, and it affords sufficient evidence that the talents of the author as a mathematician were considerable. An outline of the method, with its application to an example is given in Abhandlungen aus dem Königlichen Astronomischen Seminer zu Berlin (vol. iii. Nos. 184, 243, &c.) Oibers computed also the elements of the comets of the years 1781 and 1795; those of two comets which appeared in each of the years 1798 and 1799, of one in 1803 and of the great comet of 1611.

The interval between the orbits of Mars and Jupiter, which appears disproportionately great when compared with the intervals between two or the other planets belonging to our system, had suggested to the original and inquisitive mind of Kepler the idea that a planet too small to be seen from the earth, existed in that region: the idea appears to have been little regarded till M. Bode, of Berlin, obtained his empirical formula, for the distances of the planets from the sun, which, except with respect to the distances of the planets from Mars and Jupiter, was found to hold good for all the known planets, including the Georgian; when that which was before considered as the vision of an enthusiast was found to be deserving of serious consideration. With a view, therefore, of ensuring, as far as possible, a complete examination of the heavens in the parts where the supposed planet might be expected to be found, M. Schröter was induced to form an association of twenty-four astronomers, who, having divided the heavens into as many zones, were each to confine his observations to one of them. That distinguished individual was chosen President, of the 'Boden dasselbe, and the Baron Zach, of Vienna, of Legge, of the 'Board of Observers': the labours of the association were not, however, immediately rewarded; and M. Piazzi, of Palermo, who was not one of the number, had the good fortune to discover on January 1, 1801, at his observatory at Palermo, the planet Ceres, and which was found to be between the orbits of Mars and Jupiter, at a distance from the sun nearly equal to that which, in conformity to the law discovered by Bode, it ought to have occupied.

This planet soon afterwards became invisible, from its vicinity to the sun; but Dr. Oibers and M. Gauss, having calculated its orbit approximately from such observations as had been obtained, sought for it at the time when it was expected again to appear, and the former was the first to re-discover it. The idea of Kepler and the formula of Bode seemed now to be fully confirmed; but the harmony conceived to exist in the planetary distances was almost immediately, in appearance, deranged; for on the 28th of March, 1802, Dr. Oibers, being engaged in examining the northern part of the constellation Virgo, discovered a star which was not in any of the catalogues previously made up. On January 31, 1807, it received the name of Pallas. Its orbit was soon calculated, and it was found to describe a very eccentric ellipse about the sun at a mean distance from it which is nearly equal to that of Ceres: the time of its ascending node is also very similar to that of Ceres; and its plane of revolution is almost the same as that of the last-mentioned planet, but it has a much greater inclination to the plane of the ecliptic. Dr. Olbers was led, from the fact that these two planets are nearly in the same plane of space, and because some parts of space are very rarely traversed by the planes of the orbits intersect one another, to imagine that they might be dispersed fragments of a large planet which revolved, at one time, about the sun at nearly the same distance from it as Ceres, and at another time, by some great revolution or from some other cause, had been broken up. Pur-
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TO this idea, he considered that there might be other fragments, or small planets, in the same region; and the idea was strengthened when, in September, 1804, a third planet of a like kind was discovered by M. Harding of Bremen. This planet, which was named Juno, has the nodes of its orbit nearly coincident with those of Pallas, so that the two planets are also nearly equal to one another, and both planets revolve about the sun at nearly the same distance. Dr. Olbers now determined to make the discovery of new planets the principal object of research; and from 1807, he persevered in examining with the most minute attention, at the times of their opposition to the sun, the parts of the heavens which were near the nodes of the three other planets. In March, in the latter part of the year, his sagacity and diligence were rewarded by the discovery of a fourth planet; on the 3rd of April he sent intelligence of the event to his friend M. Bode, and he transmitted the series of his observations to M. Gauss. The latter astronomer immediately computed the figure of the orbit, and, Olbers having requested him to give a name to the planet, he designated it Vesta. This is the smallest of the four new planets, or asteroids, as they have been designated, and the time of its revolution about the sun is the shortest.

It may be proper to mention, in this place, that additional confirmation of the opinion of Olbers has been afforded by the discovery of a new planet on the 5th of December, 1845, by M. Hencke of Drissen, and it has received the name of Astraea; it is a small planet, and revolves about the sun, between the orbits of Juno and Vesta, in about four years.

In 1815 (March 6th) Dr. Olbers discovered, near the constellation Perseus, a comet which presented the appearance ofSidney without a train. It was supposed to be continued to observe it till the end of August, when it ceased to be visible: its orbit was calculated by Beselli and Gauss, and it was found to accomplish its revolution about the sun in 73 years. In 1826, he published a dissertation on the probability that the comet may come in collision with the Earth—a subject which then engaged the attention of astronomers on account of the near approach of the comet Biela when in one part of its orbit in 1834. He forwarded a proposal for a reformation of the constellations and a revision of the nomenclature of the stars; recommending, as models, the figures in Flamsteed's Atlas, but better drawn than they are in that work, and also that the representations of persons and machines which have no relation to astronomy should be cancelled.

Dr. Olbers was elected a fellow of the Royal Society of London, 1804, and a Foreign Associate of the Académie des Sciences at Paris in 1829: he was also a corresponding member of several other learned societies, a knight of the order of Dannebrog and of the Red Eagle of Prussia. He died at Berlin on the 7th of March, 1840, at a proof of his fame and his high citizens of Bremen placed his bust in the public library of the city.

**Biographie Universelle. Supplement. Monthly Notices of the Royal Society.**

OLDMIXON, JOHN, one of the heroes of the Dunciad, was born in 1678. The place and kind of his education are unknown. His authorship appears to have begun with the drama, in which he was utterly unsuccessful; and his principal productions were historical, political, and critical. He overintended, carelessly and unfaithfully, the first edition of the collection of English historians which bears the name of Bishop Kennett. He himself wrote also 'A Critical History of England', 'The History of England during the reigns of the House of Stuart', and 'The History of England during the reigns of William and Mary, Anne, and George I'. It is large and undercumbersome, and is chiefly remarkable for their strong spirit of Whig partisanship. In criticism Oldmixon was distinguished for his unscrupulous abuse of Pope and other eminent men of his day. He found abundant material for venting his animosities, not only in continual criticism, but in his 'Prose Essay on Criticism', and his 'Arts of Logic and Rhetoric' (a clumsy adaptation from Bouhours). His party-services were rewarded by an appointment to the Board of Commissioners for the Port of Bridgewater. He died in London, in 1742.

**OMBRO-METER. [RAIN GAUGE, P. C.]**

**OMBRO-METER. [RAIN GAUGE, P. C.]**

**OMNIA**

**OMNIA**

**OMNIUM**

OMNIUM, employed in the Stoic philosophy, to express the value, taken as an average, of the different stocks in which a loan is usually funded. Thus, a loan having been contracted for on a certain day, an average is made of the stocks in which such loan is contracted, at the price which they bore on that day, and the fund thus formed as an average of the whole is called Omnium. (Mr. Colloquy's Dict. of Com.

**ONAGRA. [ESOTHEKA, P. C. S.]**

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**ONATAS (Ovand) of Aegina, the son of Micron, was alike distinguished as a painter and a sculptor: he was contemporary with Polygnotus, and lived accordingly in the early part of the 5th century before the Christian era. His name does not occur in Pliny, and, with the exception of an epigram upon a statue of Apollo by him, in the Greek Anthology, he is noticed only by Pausanias, who also gives us an account of his life. He was, however, in terms of great praise. Pausanias speaks of a group of Hymenacius heroes near the great temple at Olympia, which were dedicated by the Achaeanas in common; Thiersch attributes them all to Onatas, but his name was inscribed on one only. Pausanias says that the Achaeanas in common dedicated those statues which represent the Greeks who drew lots for the challenge of Hector; they stood armed with spears and shields near the great temple; opposite to them was Nestor with the lots in a helmet. There were eight besides Nestor; the statue of Ulysses, which made the ninth, and had been removed by Nero to Rome. Of the remaining eight, on the other hand, five werekeys, and his name is inscribed upon it, and it was written from right to left. On the shield of another was represented a cock, and this, says Pausanias, was Idomeneus, the grandson of Minos. In the interior of the shield was an alluding inscription, which appears to apply to the statue of Idomeneus alone:

**ΠΑΛΛΑ ἂν θεῷ αὐτόν μοιράσαι καὶ ἄν' ὄντες **

**Εὔρος, ἐν ἔφερεν τὸ τέμπλω μετὰ Μίνω.**

As well as many others, this is the work of the aulic Onatas. Micron was his father, his birth-place Aegina.

The Thasians also dedicated a bronze statue of Hercules by Onatas at Olympia, with a club in his right and a bow in his left hand; it measured ten cubits, and the name of Onatas with his birth-place and parentage was inscribed upon it. Pausanias observes with respect to Onatas that he was not surpassed by any artist that had appeared in the school, or from the workshops, of Attica, since Daedalus; that is, from Daedalus to Onatas's own time, which was shortly before Phidias.

Pausanias mentions further, by Onatas, at Olympia, a Mercury carrying a ram under his arm; he had on a helmet and a cloak besides a tunic or under robe; he was assisted by Callitēs, whose Pausanias supposes to have been the son or pupil of Onatas.

Onatas cast also in bronze a statue of Ceres the Black, or Demeter Melaina, for the Phigalians, in the place of an old wooden image which was destroyed by fire. Onatas cast the new statue, but when it was delivered he refused to accept one, assisted by a vision in a dream: it had a horse's head. He made also a statue of Apollo, at Pergamum, magnificent for its size and its workmanship.

Onatas had also the bronze charter of Hiero, dedicated by his son Deinomènes at Olympia in honour of his father's victories in the games: the horses and riders were by Calamis. He made also, together with Calyntus, an artist otherwise unknown, the monument dedicated by the Tarentines at Delphi: they sent a tenth of the spoils taken from the Peucetii, a neighbouring barbarous people. The offerings consisted of several figures of warriors on foot and on horseback: Opis, king of the Lacedæmonians, who assisted the Peucetii, was represented dying; near him stood the hero Taras, and Phalanthus, by whom was a dolphin; Phalanthus was saved from shipwreck in the Crissaean sea and brought on shore by a dolphin.

Onatas is mentioned only once as a painter: he decorated with Polygnotus the walls of the vestibule of the temple of Minerva Areia at Plataea. Onatas painted the most beautiful picture which has been preserved in art. Thus also he painted at Plataea the picture of Euryganea lamenting the death of her sons Eteocles and Polyneices killed by each other's hands; which, according to Sylliburgus, is by a MS. error, attributed to Calyntus; but he ascribes it to Onatas. Micron, the father of Onatas, was the celebrated Athenian painter of that name.

(Pausanias, v. 25, 27, vii., 42, vi., 12, 18, ix., 4, 5, Junius, Justin. Censor. SCHRIFTE, THIERSCH, Epoche der Bildenden Kunst unter den Griechen; Böttiger, Ideen zur Archäologie der Malerei.)
ONO, or ANGOLE, a town of Hindustan, in the Presidency of Madras, and Northern Carnatic. (Carnatic, P. C. H.) One of the largest and wealthiest towns in the province. It is situated in 15° 31' N. lat., 80° 1' E. long., 173 miles N. by W. from Madras. The sovereignty of the district and town of Ongole was acquired by the East India Company in 1823, by treaty with the Nawab, to whom it previously belonged. The town was then strongly fortified, but the fortifications have been suffered to fall into decay or have been destroyed.

(Don's Eastern India Gazetteer.)

ONOBYCHIS (from ονοβ, an ass, and ὕπαυξι, to graze the teeth), a genus of plants belonging to the natural order Leguminosae. It has a calyx with five nearly equal subulate teeth, exceedingly long, longer than the wings; the pod one-celled, compressed, indehiscent, one-seeded, upper suture straight, lower curved, toothed, winged or crested. The species of this genus are natives of Europe or Asia, with unequaly plane leaves, and axillary elongated pedicels having spikes of flowers red or white at their tops. The most common, as well as only British species is Onobyclus satina, common Sainfoin. (Sainfoin, P. C. H.; Hedbarum, P. C. S.) About forty other species have been described, but none of them possess useful properties. Many are showy plants when in bloom, and are adapted for flower borders or rockwork. They may be propagated by seeds.

(Onobyclus's Dictionary; Babington's Manual of British Botany.)

ONONIS (from ονον, an ass, and ονον, to delight, of some of the species being said to be grateful to ass), a genus of plants belonging to the natural order Compositae. It has a silky cleft campanulate calyx, narrow segments, the lower ones longer. The keel is beaked, the style filiform and ascending, the stigma terminal and subapetalous. The flower stalks are hairless, the stem is more or less pubescent. There is a procumbent uniformly hairy stem, axillary stalked flowers, broadly oblong leaves, ovate pods shorter than the calyx. It is usually without spikes. The stems root at their base, and the seeds are tubercular.

O. antiquorum has an erect or ascending stem, bifurcately hairy; axillary stalked flowers, oblong leaves, and ovate, erect pods longer than the calyx. It is doubted by many botanists as to this being true O. antiquorum. Koch and Reichenbach both describe quite a different plant, with smooth seeds.

O. recta has a viscid pohsecestem, axillary flowers with one flowered pedicles shorter than the leaf flower, a pod without bracts, the corolla about equal to the calyx, oburate, lanate leaves serrated at the lip, ovate stipules, and cylindric reflexed pods. It is found in sandy places in Galloway and the Channel Isles, and in the south of France by the sea coast.

There are 107 species of this genus described, but none of them are used in medicine or the arts. They are chiefly native to Europe and Asia, and a few on the coast of Asia. They are generally handsome when in flower. The hardy shrubby kinds are increased by seeds and layers, the hardy perennial kinds by dividing the roots in the spring, or by seeds. These are well fitted for flower borders. The seeds of the hardy annual kinds only require to be sown in the open border in April. The greenhouse and frame species thrive well in a mixture of loam, peat, and sand; these are usually increased by seeds which ripen in abundance.

(Ononis's Dictionary; Babington's Manual of British Botany.)

ONOPODURUM, a genus of plants belonging to the natural order Compositae. It has a honeycomb receptacle, a fourribbed fruit, and an imbricated involucre, with simple spinous pappus scales.

O. Acanthium, Cotton-Thistle, has an erect many-headed stem, elliptic oblong leaves, woolly on both sides; serrate, spinous, and depressur; the outer involucral scales lanceolate, subulate, recurved, and spreading. The stem is from four to five feet high. (S. & G.) The flower head is from 2 to 3 inches in diameter. The flower is lucre nearly globose, large, and somewhat corymb; the scales fringed with spinous teeth; the florets are purple. This plant is found on waste ground in Great Britain and Spain. Another name for the same species is Widow's-Artichoke, or Alcachofa of the Spaniards, on account of the fleshy receptacle being once cultivated as an esculent vegetable. The expressed juice of this plant is said by Eiller to be a serviceable emollient for the breast, and to cleanse foul ulcers; and a decoction of the root, which is siringent, has been used to restrain discharges from the mammary membranes. The seeds are used as an infusion, as the result of experiments, that 22lbs. of onopordum heads will yield 12lbs. of seeds, from which 3lbs. of oil fit for burning may be extracted by heat.

(O. obtusifolium's Manual of British Botany; Burnett's Outline of Botany.)

ONOSMA (from ονοσμ, an ass, and σμα, smell; grateful to the ass), a genus of plants belonging to the natural order Boraginace. It has a five-parted calyx, a tubularly campanulate corolla, and a naked throat. The anthers are agglutinate, and connected together by the bases of the lobes. The nuts are ovate, strong, and fixed to the bottom of the calyx, unperforated at the base, indefinite at the apex. The speck is small, and of plants, with crowded lanceolate or linear leaves, and terminal racemes of large yellow second and usually drooping flowers.

O. Emodi has lanceolate three nerved leaves, less hairy beneath, terminal solitary racemes, linear bracts, not half so long as the flowers; the calyx is five cornered with ovate segments, a ventricose five-keeled corolla contracted towards the mouth, and the anthers longer than the filaments. It is native of Nepal, in Chosinathan, where it is called by the natives Maharanja. The root is bruised, of a dark purple colour, and is used in dyeing.

O. schinum is a hirsut plant, covered with white pentgent hairs. It has a long graceful and pedicellate flowers. The corolla is yellow, a little longer than the calyx, tubularly campanulate with reflexed teeth.

O. sarmentosum is native of Tauria, in the vicinities of the Bosphorus. This species is very common, and is a shrub, black and covered with a red pigment, which stains paper a violet colour.

All the species of this genus, which exceed thirty in number, are extremely handsome when in blossom, but are not valuable on account of any peculiar properties. Most of them are natives of rocks and sandy places in Europe and Asia, and answer well to grow in rock work or wall tops. They are short-lived, and apt to rot. They do well, however, in small pots among other shrubs and plants.

(Don's Gardener's Dictionary.)

OSTEHERIUM, situated in 51° 30' N. lat. and 4° 52' E. long., is a market-town in the province of North Brabant, in the kingdom of the Netherlands. The population is about 8000 inhabitants. There are numerous potteries, brick-kilns, and three annual fairs for cloth, linen, and shoes.

Stain, Leiden; Hassel, Handbach; Cannich, Laubach.)

OPACITY is a condition of bodies under which they are incapable of transmitting light through them. It seems to depend upon the nature or disposition of the particles of bodies, but its precise cause is, at present, far from being understood. According to Natta, opacity may be due to the presence of a solid layer of a homogeneous nature, as glass, diamond, &c., the light experiences so much less of these irregular actions that, except when the thickness of the medium is very great, it is enabled to pass quite through them.

The entire absorption of all the light which enters a substance, merely by the multiplied refractions or reflections which it undergoes within the mass, is difficult to conceive; and the advocates of the undulatory theory ascribe opacity to the unfitness of the pores, or intervals between the particles of a body, for permitting the vibrations of the particles of ether, and consequently for continuing in the interior the existence of the waves which are incident on its surface. The same persons consider transparency to consist in such a disposition of the particles of a body that the incident waves of ether can be propagated with a certain degree of freedom through the mass: some impediment to the propagation of the waves may exist in the most transparent substances; and hence when such substances have more than a certain thickness, the waves cease to be transmitted through them. (Transparency, F. C.; Absorption of Light, F. C.)

OPERATION. In this article we intend to point out the principal steps of the application of the calculus of operations [Operation, F. C.] to the solution of differential equations and equations of the highest orders. The following are the steps which must be carefully read before the present one, and also the general principles laid down in Algebra, F. C. S.

However much the calculus of operations may throw light upon the character and principles of algebra, its application is at once

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time have been thought unlikely that it should much facilitate actual processes. It does this, nevertheless, and nowhere more than in the subject we are now going to describe.

Solutions which by the usual method \( [\text{VARIATION OF PARAMETERS}] \), P. C. S., would never have been considered fit examples for an elementary work, on account of their complexity, may be represented with ease, and obtained in full with very little trouble.

When rules of algebra are true of the meanings of any symbols, all consequences of the use of these rules, all relations which are legitimate deductions from them, also represent truths. Not that these truths are always intelligible without subsequent interpretation; nor do we mean to say that, in the present state of the science, the interpretations are always attainable. And further, it may happen that theorems can be pointed out, derived from processes in which some only, and not all, of the fundamental rules of algebra are true. This does not prevent our right to deduce conclusions from such theorems, as long as we use no fundamental rules except those which are true of the expressions in question. For instance, we have seen that the operations of our calculus are not convertible with the operation of multiplying by a function of the variable. Thus if \( E \) stand for the direction to change \( x \) into \( x + 1 \), \( D \) for that of forming the difference which arises, and \( L \) for the direction to take the differential coefficient with respect to \( x \), we have no right to say

\[
E \frac{\partial f(x)}{\partial x} = E \partial f(x), \quad \frac{\partial f(x)}{\partial x} \neq D \partial f(x), \quad \frac{\partial f(x)}{\partial x} \neq D f(x) \quad \text{in which } x \text{ is a function of } x.
\]

It is the operation on \( x \) alone, this convertibility of operations is the only rule of algebra which fails; it is therefore the only one the use of which we must avoid.

The operations \( E \), \( L \), and \( D \) are closely connected with \( E^a, L^a, D^a \), of which they are particular cases; a being a constant, positive, negative, or nothing. We have

\[
\begin{align*}
(E-a) f(x) & = e^{a(1)} \Delta(\Delta-a) f(x) \\
(D-a) f(x) & = e^{a(2)} \Delta(\Delta-a) f(x)
\end{align*}
\]

The first sides of these equations being representations of \( f(x-1)-ax, \Delta f(x), \Delta f(x)-ax, \) and \( \Delta^2 f(x)-ax \). If these operations be repeated, we have

\[
\begin{align*}
(E-a)^n f(x) & = e^{a(1)} \Delta^n (\Delta-a) f(x) \\
(D-a)^n f(x) & = e^{a(2)} \Delta^n (\Delta-a) f(x)
\end{align*}
\]

These results will also be found to be true when \( m \) is negative, by which means we are enabled to interpret \( (D-a)^{-1} \), \( (D-a)^{-1} \), and \( (E-a)^{-1} \) and their repetitions.

These same forms may be extended, as follows: Let \( E_x \) and \( E_y \) severally denote the operations of changing \( x \) into \( x + 1 \) and \( y \) into \( y + 1 \); and let \( D_x , D_y , \Delta_x , \Delta_y \) be similarly interpreted with respect to the differentiations and differences. We have then

\[
\begin{align*}
E_{x-a} \cdot E_{y-b} f(x, y) & = e^{a(1)+b(1)} \Delta_x \Delta_y \Delta_x^a \Delta_y^b f(x, y) \\
(D_{x-a} \cdot D_{y-b}) f(x, y) & = e^{a(2)+b(2)} \Delta_x \Delta_y \Delta_x^a \Delta_y^b f(x, y)
\end{align*}
\]

in which the function first operated upon is left out to save room. Here \( m \) and \( a \) may be either positive or negative integers. And even \( m \) or \( a \) may be symbols of operation, but not with respect to \( x \) and \( y \) respectively.

\[
(D_{x-a} \cdot D_{y-b}) f(x, y) = e^{a+b} \Delta_x \Delta_y \Delta_x^a \Delta_y^b f(x, y)
\]

in which the function is not altered, but the variables are changed. Interchanging \( y \) into \( y-\alpha y \), differentiate \( m \) times with respect to \( x \) and \( y \), change the order of the terms.

The results we shall give shall be the heads of some methods of solution, observing that this article is intended only for those who can already master the same solutions by other methods.

Take the common linear equation

\[
d^y y + a_1 d^{a-1} + \ldots = 0
\]

in which \( a \) and \( b \) are constants, and \( x \) a function of \( x \). The operation performed upon \( y \) is \( aD^b + bD^{a-1} + \ldots \); if this be called \( G \), then \( y \) is the result of performing the inverse operation

\[
G^{-1} \quad \text{upon } x.
\]

By the method explained in \textsc{Fractions}, \textsc{Decomposition of P. C. S.}, transform \( (aD^b + bD^{a-1} + \ldots)^{-1} \)

\[
A(D-a)^{-1} + B(D-b)^{-1} + \ldots = 0
\]

into \( A(D-a)^{-1} + B(D-b)^{-1} + \ldots = 0 \), \( \alpha, \beta, \ldots \) are the roots of the algebraical equation \( a \alpha^n + b \alpha^{n-1} + \ldots = 0 \).

Then \( y \) is

\[
A(D-a)^{-1} X + B(D-b)^{-1} X + \ldots = 0
\]

or \( A \ast f(x) \ast X + B \ast f(x) \ast X + \ldots = 0 \), substituting for \( f(x) \) its usual mode of expression. The arbitrary parts of the solutions will be obtained by the constants of integration in the usual manner. But the arbitrary part will always be obtained, in all inverse operations, by considering the function operated upon as \( X+0 \), and operating separately upon \( X \) and \( 0 \). Thus \( (D-a)^{-1} X \) may be completely expressed by

\[
\ast f(x) \ast X + \ast f(x) \ast X = 0,
\]

the second term of which is \( \ast f(x) \ast X = P(x) + Q(X) \), \( P \), \( Q \), and \( R \) being any constants.

Suppose that there are equal roots in the above equation, say three roots equal to \( a \). The resolution of the fraction gives terms of the form

\[
K(D-a)^{-1} X + L(D-a)^{-1} X + M(D-a)^{-1} X
\]

which contribute to the general value of \( y \),

\[
\ast f(x) \ast X + \ast f(x) \ast X = 0
\]

and the arbitrary part \( \ast f(x) \ast X + \ast f(x) \ast X \).

The linear equation of differences corresponding to the above is

\[
\sum a_n x = 0
\]

where \( u \) is a function of \( x \) to be determined. The operation performed upon \( u \) on the first side is \( aD^e + bD^e + \ldots \)

Every single root \( a \) contributes to the solution a term of the form

\[
A(D-a)^{-1} X + B(D-a)^{-1} X
\]

in which \( \Delta x \) may be any function of which the difference is \( x \). If \( x \) is an integer, what is called \( 2(x-\alpha) \) will do.

Any set of equal roots contributes terms of the form

\[
A(D-a)^{-1} X + \Delta x = 0
\]

Any linear equation being given, in which either of the operations \( D_x, D_y \) or \( D_y, D_y \) is combined with either \( E_x, D_y \) or \( E_y, D_y \), the form of the solution may be found. Take for example

\[
\frac{d}{dx} u_x, u_y + ax + by = x
\]

the operation performed upon \( u \) on the first side is \( D_x - aE_x \) and accordingly we have

\[
u_x + u_y = e^{a+b} \ast f \ast x \ast d_{x+1} X
\]

which is one form of the solution, and must be interpreted by expanding

\[
e^{a+b} \ast f \ast x \ast d_{x+1} X
\]

Another form can be obtained from

\[
E_x - \frac{1}{a} D_y u_{x+y} = \frac{1}{a} X
\]

We can only touch very briefly upon these points, and rather to show the existence of the system than to enter into it. Further details will be found in the \textit{Library of Useful Knowledge}, in the \textit{Treatise on the Differential Calculus}, pp. 781-784.

The theorems answering to that of integration by parts, when \( D \) and \( E \) are used, are as follows. To save room let \( D = aE \) and \( E = aD \) be denoted by \( \alpha \) and \( \beta \). Then

\[
e^{-\beta} (Fg) = \alpha e^{-\alpha} e^{-\beta} (Fg)\]

\[
\Delta^{-\beta} (Fg) = P(a) - Q(a) - \Delta(a) P(a) - Q(a)
\]

\text{P and Q being functions of } x \text{, to which } D \text{ and } E \text{ refer, and } P \text{ meaning } \frac{d}{dx} \text{. If } a = 0 \text{, the first becomes}

\[
\int f d_{x+1} X = P(0) + \frac{1}{a} X
\]

which is the formula for integration by parts. And if \( Q \) be of the form \( \alpha P \), \( \alpha Q \), \( P \) and \( Q \) being a rational and integral function of a lower degree than the nth, the preceding opera-
tions carried on will show that \( e^{-1}(P_0 R) \) and \( A^{-1}(P_{AB} R) \) can be performed without leaving any trace of inverse operation in the result. Of the first of these it is a particular case that

\[ \int_{\partial D} e^R \, dx = 0, \]

an equation of the eighth degree. There are eight equations of the seventh degree. Two of them are discovered at once by performing the operations \((D-1)^{-1}\) \(\text{and } (D-2)^{-1}\) on both sides, giving

\[ (D-1)^{-1}(D-2)^{-1} = \frac{1}{A^2} \text{for } x^2 = 2x^2 \text{Sd}x, \]

and the operation must be repeated; and so on.

(See the Cambridge Mathematical Journal, vol. iv. pages 60, 96.) This work abounds in uses of the calculus of operations; it was here in fact that the late D. F. Gregory first introduced this branch of it. See also the Examples of the Differential Calculus, by the same author. Mr. Boole, in a recent volume of the Philosophical Transactions, has given great and ingenious extensions to the subject.

OPHIDIUM (from \( \text{ophis} \), a snake), a genus of malacostracous fishes of the Eel tribe. The species have smooth heads; long slender bodies, margined by the united dorsal, anal, and caudal fins. The jaws, palate, and pharynx are all furnished with teeth. The branchial aperture is large. The species vary in form and colour, and in the presence, absence, and number of the various organs of the internal organs, attached to the under jaw. Two species inhabit the British seas, but both are very rare. In the Mediterranean, the bearded ophidiidium is common, and is used for food.

OPHIOGLOMUS (from \( \text{ophios} \), a snake, and \( \text{glosa}, \) the tongue), a genus of plants belonging to the natural order Filices and the tribe Ophiodensae. The thecae are conolate, disposed in a simple distichous spike attached to an unarticled frond.

O. vulgaris. Adder's Tongue, is the only British species. It has an ovate oblong frond, and is from 4 to 12 inches in height. The spike is club-shaped, usually rather longer than the frond, sometimes very long. This plant is generally distributed over England, and in many places is exceedingly common, covering large plots of ground, and is highly injurious to the crop of grass. It is less frequent in Wales, Scotland, and Ireland. It is a common plant on the continent of Europe, and is said to occur in Africa and North America. Like most singular-looking plants, it has been used in medicine for a number of years, and is supposed to be a valuable remedy for all sorts of diseases.

O. vulgatus. Adder's Tongue is dry in the third degree. The leaves of Adder's Tongue stamped in a stone mortar and boiled in olive oil into the consumption of the juice; until the herba be dry and parched, and then strained, will yield a most excellent green oil or rather a balsame for green wounds comparable to oil of St.-John's-wort, if it do not far surpass it by many degrees, whose beauty is such that very many artists have thought the same to be mixed with verdigris.' Lightfoot says that the common people in Scotland make great use of the leaves, and use it as a vulnerary. It is also used in the same way in many parts of England.

(From Newman, Brit. Farns; Babington, Manual of British Botany.)

OPHYXYLON (from \( \text{ophy} \), a serpent, and \( \text{xylos} \), wood, because it has a twisted root and stems), a genus of plants belonging to the natural order Apocynaceae. It has a 5-cleft permanent calyx, a funneled-shaped corolla with a long tube, thickest in the middle, and a 5-cleft oblique limb. In India there are subspecies in the middle and the trochilidinds the tube. The ovary is double, each lobe with one ovule, a filiform enclosed style and a capitate stigma. The drupes are baccate, black, about the size of a pea, twin, or solitary by abortion, each containing a one-seeded wrinkled nut.

O. serpentiformis, Serpentine Snake-wood, is native of the West Indies. In rich soil it becomes a climbing plant, but in poor soil it is a small erect shrub. The leaves are in threes or fives; they are short-stalked, oblong, pointed, wavy, and smooth. The peduncles are long, smooth, round, sometimes nearly erect, sometimes drooping. The pedicels and calyces are of a bright red colour, and the calyx of the root of this plant is supposed to be used by the Telenga physicians as a remedy in many diseases. It is given inwardly as a febrifuge and after the bite of poisonous animals. The juice is also expressed and drunk, or the eye to the same purpose, and it is likewise given to promote delivery in tedious cases of labour. This plant is of easy culture and beautiful appearance. A mixture of loam, peat and sand is the best soil, and cuttings and readily strike and show a glass in heat.

(Don, Gardner's Dictionary. - Lindley, Flora Medica; Burnett, Outlines of Botany.)

OPHYRYS, a genus of plants belonging to the natural order Orchideae. It has a patent perianth, a variously lobed lip without a spur. The glands of the stalks of the pollen masses each in a distinct pouch.

O. opfera, Bee Orchis, has a tupid 3-lobed lip, the two lower lobes prominent and with a hairy base, the tube intermedium reflexed, truncate, terminal, acut, elongated and reflexed; the anthers with a hooked point, the petals oblong, bluish, downy. It is about a foot high, and has large, few, and rather distant flowers. The sepals are whitish tinged with purple. The lip is velvety, brown, variegated with yellow. It is one of the handsomest species of orchidaceous plants, native of Great Britain, and grows on chalky calcareous soils.

O. arachnites, late Spider Orchis, is distinguished by a terminal, infixed, flat, rather heart-shaped appendage, and delitd downy petals. The sepals are pink, the lip dark purple variegated, with a yellow disc, the appressed, the green, never reflexed. It is found on chalk downs near Folkestone and Sittingbourne in Kent.

O. transeus, Spider Orchis, has 5 oblate lobes, the middle lobe large, arcuate, with a erect appendage, the petals linear and puberulous. This species is smaller than the preceding, and with fewer flowers. The petals and sepals are green and quite glabrous. The lip is of a dark brown colour, hairy, and covered with pale or yellowish lines. It is found in chalky places in Kent and Sussex.

O. mucroneata, Fly Orchis, has an oblong trid or lip with a large pale spot in the centre, the middle lobe is elongated, dilated, the anthers short and obtuse, and the petals filiform. It is a slender plant and grows about a foot high. The petals are very narrow, and of a purple colour, the sepals green, and the lip of a purplish brown colour, the spot in the centre of the lip is a bluish tint. It is found in damp calcareous thickets and pastures in Great Britain.

(From Babington, Manual of British Botany.)

OPORINIA, a genus of plants belonging to the natural order Compositae. It has a capitulum, the head of the flower, the exterior scales much smaller in several rows, a punctured receptacle, attenuated uniform fruit; the pappus of all the fruit in one row, feathery, dilated at the base.

O. antennulata, the medicinal leaves, linear, lanceolate, toothed, or pinnatifid, nearly glabrous; stalk branching, scaly, and thickened upwards, the involucre glabrous or hairy. This is the Aptenia antiquata of Smth and the Lactuca antiquata of Koch. It is a native of Great Britain in meadows and pastures and on lofty mountains.

(From Babington, Manual of British Botany.)
OPHANAX, a genus of plants belonging to the natural order Umbellifere; it has an oblong calyx, roundish entire petals rolled inwards, with a rather scaly lobe; compressed seeds, and a diploate letter, which with unequally cuneate segments, crested and obtuse. The umbels are compound; the involucres both universal and partial, and the flowers yellow.

The native of the south of Europe and Asia Minor, on dry hills, margins of fields, and thickets. It is a plant six or seven feet high, of a dull yellowish colour, and resembling a parsnip. The stem is strongly furrowed; the leaves from one to two feet long, or even, flat, elliptic, with ovate cordate leaflets, which are usually obsolete at the base, often confluent, and surrounded by a curtiligineous cordate border. The calyx is inconstant, the styles rather short and hairy. All this plant is a native of Europe, the resinous gum which exudes from the stalk or root when wounded is brought from the Levant and East Indies in roundish drops of a reddish yellow colour, with specks of white. It is supposed to be an emmenagogue, but it is seldom used; it is similar in its effects to asafoetida. This is a plant of easy culture, and may be propagated either by seeds or dividing at the root.

(Don's Gardener's Dictionary; Lindley's Florae Medic.)

OPTOMETR (from the Greek words οπτική, to see, and μετρώ, a measure) is an instrument devised for the purpose of ascertaining with precision the refractive powers of individual eyes at which moment they are distinctly seen. The idea originated with Scheiner; but such an instrument was constructed by Dr. Porterfield for the purposes just mentioned, and was afterwards improved by Dr. Young, who named it the Young's Optometer.

Dr. Porterfield's contrivance consisted of a convex glass lens affixed by its frame to a slip of wood about two feet long: a pencil of light, diverging from a radiant point in the axis of the lens, was suffered to fall on a plate of metal in which were two small perforations; and the rays which passed through these, after being refracted in the lens, were received on a screen, where they formed in general two bright spots, but in certain positions of the lens and screen the spots united and coalesced as to form but one image. The distance of the single image from the lens, being measured by a scale of inches, constitutes the focal length of the lens for rays diverging from the radiant point. Dr. Porterfield used the instrument to determine the distance at which distinct vision of a small object takes place in the eye; the latter being substituted for the screen, to receive the rays coming from the object through the two perforations.

The instrument constructed by Dr. Young consisted of a slip of ivory, unpolished, or of wood covered with white paper, about eight inches long and half an inch broad, on which a black line, of its length, was divided into a number of well-defined black lines. At one extremity of the slip was fixed a plate of ivory, or a piece of card, nearly perpendicular to its length, and this was perforated either with a single eye or a pair of eyes; the distance of this from the distal end varying from 4th to 8th of an inch, but not exceeding the diameter of the pupil of the eye.

On applying the eye to a single aperture, and looking in the direction of the line drawn on the instrument, the line appears to have a certain breadth, and to be ill defined, at the nearest extremity: the breadth gradually diminishes at points successively more remote till it becomes a minimum, when the line becomes distinctly seen; but the point of its commencement increases in breadth, becoming again ill defined. On applying the eye to a double aperture, the line appears to be double, the parts seeming to cross one another at a very acute angle; and the intersection is at the place where a single line would have had the minimum breadth; beyond this intersection the two lines appear to diverge from one another, and become indistinct.

The point of intersection is at that distance where the minute object being placed, its image would be distinctly seen by the eye at the aperture, and its distance from the eye may be immediately found by means of a scale of inches on the instrument, a sliding index being, at the time of making an observation, placed on the horizontal line through the point of intersection.

This distance affords, evidently, a measure of the refractive power of the observer's eye; since rays of light diverging from a small object at that distance are, by the lenses of the eye, brought to a focus on the retina, and those rays which fall on the iris and pupil of the eye, as to form there a single and well defined image. If the object were brought either nearer to or removed farther from the eye, the rays, after passing through the two apertures, would form two images, both of which would appear to be less perfectly defined than the single image.

It being assumed that a person whose sight is perfect sees a small object 8 inches from his eye, Dr. Young obtained by computation a series of numbers which he placed on the scale of the optometer, at such distances from the plate containing the aperture, that a spectator having one of them fixed for his eye (or use one which one of the persons who are advanced in life, has distinct vision of small objects only when they are at greater distances than 8 inches) on looking through the slits and observing the place where the two images of the same object met, he would ascertain, at once, by the number at the place, the focal length of a convex lens which would enable him to see distinctly at 8 inches. He also computed a series of numbers which he placed on the scale at distances 1, 2, 3, and 4 inches from the small eye (or any one which has distinct vision of objects at less than that distance from it, on observing the place at which the lines appeared to intersect one another, might ascertain the virtual focus of a concave lens which would enable him to see distinctly at 8 inches. The optometer thus became a means of enabling persons to make choice of the proper lenses for spectacles which would correct the imperfections of their own natural vision.

But the scale of Dr. Young's optometer being, for convenience, only 8 inches long, and the inferior limit of distinct vision is a presbyopic eye being beyond that distance, Dr. Orsagna, another great optician, who has developed the subject to a wonderful extent, has applied his mind to the subject, by which the point of distinct vision for such an eye was reduced within 8 inches from it: the numbers on his scale were therefore computed for the instrument when furnished with a more refined eye.

Dr. Young used the optometer for the purpose of determining the refractive powers of the eye, not only in its usual state, but also when, in cases of cataract, the crystalline lens had been displaced or extruded, and when the effect of the corneal cornes had been rendered null by immersing the anterior part of the eye in water, which was contained in a cell of a proper form, and having a plane glass in front. By such means he endeavoured to ascertain in what manner the eye accommodates itself to distinct vision for objects at different distances from it; and his conclusion is that the faculty depends entirely (Lectures on Natural Philosophy, vol. ii. pp. 572-603) upon changes of figure which take place in the crystalline lens.

ORCAM, or L'ARCAGNULO, is the name by which Andrea di Cione, a celebrated old Florentine artist, is generally known; he is by HamoDram, which appears to be his proper name. Vasari calls him Orsagna. He was painter, sculptor, and architect; was born at Florence in 1520, according to Vasari, or according to another account in 1524. He was of Florentine extraction. He was an ardent disciple of Donato di di Field, and his works are arranged in his Sanzaio Santo di Pisa, where the Triumph of Death and the Last Judgment were by Andrea, and the Hell by Andrea; the last Judgment and the Hell are engraved by Lasinio in a single plate in his 'Futurismo del Campo Santo di Pisa.' Orsagna repeated them in Santa Croce at Florence; he had painted previously in the Strozzi chapel in Santa Maria Novella, a picture of Hell from Dante's Inferno, in which he introduced the portraits of several of his enemies. As an architect, he built the elegant Loggia de' Lanzi in the Plaza Granducia at Florence, which is still in perfect condition; and its sculptures are engraved by Lasinio in his 'Piazza de Granducia di Firenze, con i suoi Monumenti,' Florence, 1830. He built also the church of the monastery of Or San Michele, and designed the celebrated tabernacle of the virgin of the church of Santa Maria Novella. It is a high Gothic pyramidal altar to the Virgin, free on all sides, in black and white marble, and is richly ornamented with figures and other sculptures. The following words are inscribed on the base: 'Andrea Orcagna fecit super duas mennas oratorium architecti exhibuit hojas, MCCCLXX.' It is generally attributed to the school of di Cione, Firenze,' after a drawing by Andrea himself. Orcagna generally signed himself painter upon his sculptures, and sculptor upon his pictures; on his pictures he wrote 'Ferr Antonio di di Cione, Pietre.' He was also a poet. Vasari mentions some sonnets which he addressed to Burchiello; and in the works of Burchiello, published in London in 1767, there is a sonnet
addressed to Orsagna. He died at Florence according to Vasari in 1389, but according to Manni in 1375. He was a man of great taste in architecture, and has the credit of having been the first to adopt the principle of the semicircular arch in preference to the pointed; but to this merit, if one, he is not entitled, though his elegant 'Loggia de' Lanzi' may have contributed greatly towards the subsequent popularity of the arch. Among his other works, besides the semicircular arch, were the Lopo, and other circular arches, used the semicircular arch. Those, says Lanzi, who are fond of minute detail in minute things, may consult Baldinucci, Bottari, and Manni concerning Andrea. Rumbach, however, was the first to show in real name, of which Orsagna is a contraction, Lo Archangello Lo' rachiongl' orchangno. In painting, Orsagna did not go beyond Giotto; in sculpture he was worthy of notice. Of his writings, which is given by Vasari in the first edition only of his work, he was chiefly excellent as a sculptor, or rather statuary:—

His descends from the noble and princely among the Tuscan nobility, being understood to be his own. (Vasari, Vite de' Pitori, &c., and the Notices to his born's German translation of Vasari; Rumbach, Italianische Forschungen.)

ORDER IN COUNCIL. This expression is chiefly known by its connection with the West or Casersean orders of the great British government in 1807 and 1809, in retaliation of the Berlin and Milan decrees of Napoleon, by which Great Britain and her colonies were declared in a state of blockade. The measure was not very popular, not so much in France and its dependencies, but all who, either voluntarily or by compulsion, gave obedience to the decrees. A full account of the matter will be found under the head Blockades. There has been much dispute as to the legality of these orders. The law of nations has acknowledged the blockade as a legitimate form of commerce even of neutral or friendly powers, when the object is to punish the state so blockaded, and the belligerent power has a force on the spot sufficient to make the blockade actual and physical. But where a belligerent power goes beyond this, and declares some place at which it has no armed force under a state of blockade, it simply issues an edict against the freedom of commerce, authorizes its cruisers to seize vessels which are not impeding any warlike operations, and covertly declares hostilities against the states affected by the fictitious blockade. The law of nations has never countenanced such a license, and it came to be a question whether these orders in council, being thus not of an executive but of a legislative character, were legal, the Privy Council not having any legislative authority on the subject. In this matter it may be considered by act of parliament. In favour of the orders, it was maintained that they were merely part of the execution of the royal prerogative of declaring and conducting war, and that the order, or rather the act, by which individuals undoubtedly suffered, as individuals always must when warlike operations are conducted on a large scale. A analogy was taken from the exercise of the crown's prerogative during war, in prohibiting the supplying of the enemy with commodities contraband of war—an interference with the freedom of commerce justified by the necessity of the case. But these arguments did not satisfy the country generally that the measure, if it was a right one, should not have been accomplished by Act of Parliament instead of Order in Council.

It is difficult to draw the line between what may and what may not be accomplished by Order in Council. There have been various occasions on which, in cases of emergency, orders in council have been issued contrary to law, and those who have been concerned in passing, promulgating, or enforcing them have trusted to legislative protection, and taken on themselves the personal responsibility of the proceeding. In the year 1706, when there was a deficient harvest and the prospect of famine, an order in council was issued prohibiting the exportation from the British from the British. In the immediate ensuing parliament the act 7 Geo. III. c. 7 was passed for indemnifying all persons who had advised the order or acted under it, and for giving compensation to all persons on whose land it was executed. The order was referred to the order declared, which order could not be justified by law, but was too much for the service of the public, and so necessary for the safety and preservation of his majesty's subjects, that it ought to be justified by act of parliament. All orders restricting trade—unless when they are within the justification of the national war policy—and all orders counteracting the objects of the act of 1706, would require an act of indemnity. There are some matters affecting trade and the revenue, as to which orders in council are specially authorized by act of parliament. Thus in the Customs' Duties Acts, the national revenue is paid by the subjects of a state having a treaty of reciprocity with Britain, it is enacted that the treaty of reciprocity, and consequently the right to import at the lower duties, shall be declared by order in council. By the International Copyright Act, 1 & 2 Vict. c. 55, the countries which, by their conceding a term of copyright to works published in Britain are to enjoy a similar privilege here, may be declared by order in council.

OREGON QUESTION. The country known by the name of Oregon is bounded on the south by the parallel of 42° N. latitude, being the northern boundary of Mexico. On the north this territory is bounded by the parallel of latitude 54° 40', or, more strictly, this is the northernmost point on the coast, for in this latitude the irregularly shaped boundary of the Russian possessions in America terminates. On the east of it are the Rocky Mountains, and on the west the Pacific Ocean. It occupies a space of about thirteen degrees of latitude and fifteen degrees of longitude. Besides the Rocky Mountains, there are two other ranges, one called the Far West, or Cascades, and the other the Blue Mountains, dividing the country into three divisions, which are distinguished by peculiarities of soil and climate. The country between the Rocky and the Blue Mountains is almost uninhabitable by those who are not mounted on horseback. The land is not very far from the Pacific Ocean, is of small extent, and is not very valuable from a commercial point of view. The valley of the river Willamette, a tributary of the Columbia, is the most fertile district, is about 150 miles long and 60 broad. Wheat produces here about 20 to 30 bushels an acre. The winter is wet and stormy.

The territory north of the Columbia river and south of the parallel of N. latitude 49°, is that which is in dispute between the government of Great Britain and the United States. It is bounded on the east and the south by the Columbia river, on the north-west by the Straits of Juan de Fuca, on the west by the Pacific Ocean, and is roughly estimated to be a little larger than the state of New York. In the eastern half of this 'disputed territory' is described as 'a worthless desert,' the other half has a very large proportion of bad land. President Polk has claimed for the United States the territory north of 49° north latitude, as well as south of 49° to latitude 42°. Between Fraser's river, or latitude 49° and 54° 40', Captain Wilkes states, that nowhere on the coast could a settlement be formed that could supply its own wants. The claims of Great Britain and of the United States are both founded on an alleged title derivable from discovery, settlement, and treaty. Some writers have added to these elements of title, what they call 'contiguity,' but this is of no importance in the dispute.

I. The discoveries along the coast have been as follows:—

<table>
<thead>
<tr>
<th>Navigator's Name.</th>
<th>Flag.</th>
<th>Date.</th>
<th>Latitude reached.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ulton</td>
<td>Spanish</td>
<td>1589</td>
<td>30°</td>
</tr>
<tr>
<td>Cabrillo</td>
<td></td>
<td>1543</td>
<td>37° 10'</td>
</tr>
<tr>
<td>Cabrillo (Cabrillos' pilot)</td>
<td></td>
<td>1543</td>
<td>40° 20' 40'</td>
</tr>
<tr>
<td>Drake</td>
<td></td>
<td>1579</td>
<td>49°</td>
</tr>
<tr>
<td>Galis or De Giuila</td>
<td></td>
<td>1584</td>
<td>37° 47' 37' 57° 58'</td>
</tr>
</tbody>
</table>

[The 57° 58' is an alteration of a translator; the original account is 57°, in words, not figures.]

| Vascoño | | 1596 | 49° |
| D'Agricol | | 1596 | 47° |
| Pelle | | 1774 | 55° |
| Heceta | | 1777 | 53° 36' |

[Inferred the existence of the Columbia from the general appearance of the embouchure or bay, and named it San Francisco].

| De la Bodega | | Spanish | 1775 | 58° |

[These last three voyages were kept secret by the Spanish Government].
Navigator’s Name. | Flag | Date | Latitude reached.  
---|---|---|---
Cook | English | 1778 | 44° to beyond 60°.  
[Early maps scarcely began Cook.]  
Commercial Expedition | Russian | 1780 | 60°.  
[Planned from information obtained from King, Cook’s successor. It started from the north, and proceeded no farther than the Arctic Circle.]

Various commercial enterprises, chiefly English, then took place, which ended in the seizure of English vessels by the Spanish Government in 1789. In 1800, the well-known names of Dixon, Portlock, Duncan, Colnett, Barclay, Douglas, and Mears; the last of whom may fairly stand Cook and Vancouver as discoverers, in the immediate region north of the Columbia.

Vancouver | English | 1792 | Surveyed the Coast.  
[Informed the existence of the Columbia from the river-colored water.]

Gray | American merchant | 1792 | Entered the Columbia.  
Baker | English merchant | 1792 | Entered the Columbia.  
[Broughton found Baker there, which shows that he had also been there in the earlier part of the year.]

Broughton, Vancouver’s Lieutenant, surveyed the Columbia for upwards of 100 miles above the estuary, and took possession, with the consent of the Indians.

The following are romances.

Lorenzo Maldonado | Spanish | 1588
Juan de Fuca | Spanish | 1592 | Professed to have discovered the north-west passage by sailing through the continent of North America.

Fonte, or De Fuenteras | Spanish | 1640 | 77°.  
[The last of the Spanish voyages—was published in 1708, in London, in ‘The Monthly Miscellany, or Memoirs of the Curious.’ Neither Fuenteras nor Fuca was ever noticed by Spanish writers. Fuca invented his story with a view of getting employed by Elizabeth; Fuenteras never existed.]

Hakluyt, in his ‘Collection of Voyages,’ published in 1589, states that Drake merely reached the lat. 40°, but his account is interpolated in the volume which contains it, and he appears to have intended to suppress it. In the edition of 1600 Hakluyt places the northern point of Drake’s voyage in latitude 43°.

The authorities for the higher latitude are: 1. ‘The World Encompassed,’ printed in 1578; and 2. Hakluyt’s ‘Superintendence of Francis Drake, a nephew of the admiral, which states that the coast ‘was searched diligently even unto 45°.’ 2ndly, Fletcher, who accompanied Drake, and whose MS. is in the British Museum. 3rdly, the celebrated navigator John Davis, in ‘The World’s Hydrographical Discovery,’ printed in 1585, says, that Sir F. Drake ‘coasted all the western shores of America until he came in the septentrional latitude of forty-eight degrees, being on the coast of Newfound land.’ An authority which ought to decide the question of the limit of Drake’s discoveries. 4thly, Admiral Sir W. Monson, who had served under Drake, and who says that Davis had never seen so high a latitude. In the account of the Spanish expedition under Galizano and Valdes, published by the order of the King of Spain, at Madrid, in 1802, is this passage—‘The true glory which the English navigator (Drake) may claim for himself is, having discovered the portion of coast comprehended between the parallels of 43° and 48°, to which consequently the name of New Albion ought to be limited, without interfering with the discoveries of preceding navigators. The discovery of the coast was, therefore, made by the British. But even if Drake had not discovered it still, according to the principles laid down by jurists, the exploration of Cook would be treated as conferring a title by discovery, since the voyages of Peres, Heceta, and Bodega were not made known until 1802. (Wolf, ‘Institutes du Droit des Gens,’ § 213; Vattel, book I. i. xvii. § 307.) The discovery must be made before the occupation is against it, or that it was a mere passing act, or that occupation not being intended, the territory was abandoned. Publicity is essential to enable foreign nations to recognize and respect the title founded.

Such was the condition of the title by more discovery when the Spanish officer, Captain Martines, in May, 1789, seized the British vessels the ‘Iphigenia,’ ‘North-West America,’ and in July, the ‘Argonaut,’ Captain Mathews, and the ‘Success Royal.’ A correspondence ensued between the governments of Great Britain and Spain, which occasioned a message from the king to both Houses of Parliament, delivered May 25, 1790, stating that ‘no satisfaction was made or offered for the acts of seizure, and that a direct claim was asserted by the court of Spain to the exclusive rights of sovereignty, navigation, and commerce in the territories, coasts, and seas in that part of the world.’ The claim of sovereignty made by the British Government was objected to, and Mr. Pitt stated that it was indefensible in its extent, and had originated in no treaty nor formal establishment of a colony, nor rested on any one of those grounds on which claims of sovereignty, navigation, and commerce usually rested.

This dispute was terminated by the convention of 1819. It is the third article of which declared that ‘the respective subjects of the contracting parties should not be molested in navigating or carrying on their fisheries in the Pacific Ocean or in the South Seas, or in landing on the coasts of those seas in places not already occupied, for the purpose of carrying on their commerce with the natives of the country, or of making settlements there.’

Great Britain then renounced its title to exclusive possession, founded on mere discovery—and any similar claim on the part of Spain was abandoned. The Convention was condemned by the opposition in parliament, the chief speakers asserting that Great Britain ought to have excluded Spain, and not to have conceded to it the right to settle on the coast. When it was pointed out where the fisheries could be, Pitt replied that he should esteem the government highly culpable if it neglected to ascertain by actual survey.

Captain Vancouver was sent by the British government to take possession of Nootka Sound, and to ascertain among other things how far to the north Spanish settlements had been established. He sailed from Deptford, January 6, 1791. Nootka Sound was delivered to him, but having a discussion on the extent of his instructions with the Spanish officers, Quadra, Lieut. Mudge was sent to England for further orders. Ultimately, in March, 1795, Nootka was delivered up to Lieut. Pierre of the marines.

It was while Vancouver was on this voyage that he received information that in May, 1792, Captain Gray, of the ship Columbia, from Boston, had entered the estuary of the river now known by the name of this ship. Vancouver had on the 27th of April observed the river-colored water of the river, but he did not attempt to enter the river in consequence of being directed by his instructions not to pursue any other inlet or river than should be navigable by vessels of a burden safely to navigate the Pacific. Shortly afterwards Lieut. Broughton in the Chatham, the consort of Vancouver’s vessel, entered the estuary, and found there the ‘Jenny’ of Bristol, Captain Baker, who had been there before in the early part of the year. Lieut. B explored the estuary, discovered where the river entered it, which Gray had not done, and ascended the river above 100 miles—taking possession ‘in the name of his sovereign, Gray, it must be observed, was a more private order, which had never been communicated to him, and which had been previously discovered, and his own government never noticed his proceedings until 1814. But if he had had a commission, the discovery of the entrance of the Columbia, and the attribution of this geographical discovery, without conferring no rights, for rivers follow the title to the coast, and their discovery does not affect or impair such a title.

After Nootka Sound was delivered up in 1796, the Spaniards never made any settlement north of Cape Mendocino. They abandoned the country, and left the British to perfect their title by discovery, through occupation and settlement. The subsequent expeditions to Oregon were as follow:

<table>
<thead>
<tr>
<th>Name of Traveller</th>
<th>Flag</th>
<th>Date</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mackenzie</td>
<td>English</td>
<td>1793</td>
<td>Crossed the Rocky Mountains, and discovered Fraser’s River.</td>
</tr>
<tr>
<td>David Thompson</td>
<td>English</td>
<td>1800</td>
<td>Crossed the Rocky Mountains, discovered the North-West Passage, and explored the Columbia.</td>
</tr>
<tr>
<td>Thompson</td>
<td>English</td>
<td>1806</td>
<td>First Settlement on the Southern branch of the Columbia.</td>
</tr>
</tbody>
</table>
The expedition of Mackenzie was the first made by civilized men west of the Rocky Mountains.

The posts and settlements made by Thompson were the first established by civilized men west of the Rocky Mountains, and Thompson and his followers were the first white persons who navigated the northern branch of the Columbia or traversed any part of the country drained by this branch of the river.

Astor’s Pacific Fur Company consisted of Mr. Astor himself, six British subjects, and three citizens of the United States. Before those who were British subjects started, they asked for and received an assurance from the British minister at Washington—that in case of a war between the United States and Great Britain, they would be respected as British subjects and merchants.” The expedition received no sanction or support from the government of the United States. In 1813, the persons resident on the Columbia, having full power to deal with, sold their establishment to the North-West Company. Subsequently in the same year, Captain Black, R.N., in the Raccoon, took possession of Astoria in the name of his Britannic Majesty. Astoria was the winter headquarters of the Columbia river, under an article of the Treaty of Ghent, made in December 1814, as a post captured during the war. This was not the fact; but in 1816 possession was formally delivered up, the British government having previously stated that the post had not been captured, and that the territory had early been taken possession of in his majesty’s name (as it had been by Broughton); but that the question of title should be discussed in the negotiation on limits and other matters, which was soon to be commenced.” (Greenhow, 307, 310, 312.)

On the delivery of this post the United States for the first time exercised any act of sovereignty in Oregon. It was put into possession, but not relieved from proving its title, for its possession was derived from Great Britain.

In October, 1818, a treaty between Great Britain and the United States declared that the country should be open to the navigation of the American government, and that claims of either power or to the claims of any other power.

In February, 1819, the United States made the Florida Treaty with Spain, which declared part of the west boundary of the United States to be the watershed between the rivers that flow into the sea, both parties ceding to each other, and respectively renouncing, all claims on either side of this line. The Americans pretend that this treaty conveys a title to the coast north of 42°, though Spain never completed or obtained a title by occupation.

In August, 1827, a treaty between Great Britain and the United States extended indefinitely the provisions of the treaty of 1818, until determined by notice of a year, and it was not to impair the claims of either party. This treaty is still in force, but the Congress of the United States in April 1846, authorized the notice to terminate it to be given.

1. The government of the United States contend, notwithstanding their treaty of 1818, that Spain alone was entitled to Oregon until 1819. In reply it is said that the British title was acknowledged by the Convention of the Escorial—that Spain never made a settlement in the territory, but totally abandoned it—that Spain had no title either by discovery or occupation—that all the rights or claims which it had were derivable from the treaty of 1790—and that official Spanish writers admit the British title by discovery, 4th July, 1811. 2. It is contended that Gray discovered the Columbia, and that this is of itself a sufficient title to Oregon. In reply it is said that rivers follow the title to the coast—if the coast was discovered, the rivers follow the title to it; that Gray was not acting under a public commission, and could not, as a private person, extend the territory of the United States—

that his discovery was never noticed by his own government for upwards of twenty years—and that in the negotiation with Spain in 1819 it was not set forth.

3. The settlement of Astoria is called a national settlement. In reply it is said that the only sanction the adventurers received from the British government, that it was a mere private speculation by a party of men, the majority of whom were British subjects, who had asked for British protection—that the application to the United States government to sanction the enterprise was disapproved, and could not be planted beyond the limits of the United States without the authority of an Act of Congress.

The British title depends on original discoveries made by Drake, Cook, and Vancouver, whose acts were sanctioned and approved by of their sovereigns, and notified to the world—on the acknowledgment of the title made by Spain in 1790—the restoration of Nootka in 1795, as evidence of an acknowledgment of territorial rights—on the possession taken by British officers, which by our law, when done with the sanction of the sovereign, is alone sufficient to make a country part of the dominions of the crown—on the numerous settlements and posts which our government has allowed the North-West Company and the Hudson’s Bay Company to establish—on the recognition of the claims of the British government made by the United States in 1813 on the sovereignty which those acts of recognition proclaimed, and which was recognized by the United States before its treaty with Spain in 1819, as well as subsequently in the treaty of 1818.

Great Britain does not assert claims beyond the terms of the treaty of 1790. The United States some time since claimed the whole territory, without ever having obtained any legal authority over it, or control of it, and they now allege the extent of this bare claim as evidence of having a better title.

In the course of the early negotiations the United States government offered the boundary of 49° to the sea and the navigation of the Columbia river. Great Britain maintained that the line should run along 49° to the Columbia river, then along the Columbia river to the sea, agreeing not to erect any fort at the mouth of the river. Subsequently it agreed part of the line to be 51°, and 52°. In the last negotiation carried on by Mr. Pakenham and Mr. Buchanan, the United States offered a boundary along the parallel 49°, withdrawing the former proposal respecting the Columbia river; and the correspondence closed with an assertion of an exclusive right to the entire west coast from 42° to 54° 40’, thus denying every claim made by Great Britain and hitherto recognised by the government of the United States. There are signs that this violent policy and disregard of the admissions made in former negotiations will not be supported by the people of America, and it is to be hoped that they will not be indifferent to what is just and reasonable. The British government offered to refer the question to arbitration, and the last offer was very remarkable for proposing that the arbiters should be civilians, in order to avoid the apprehension which republicans might have of a decision by a tribunal constituted by foreign nations. They refused, and the last refusals was accompanied with most objectionable reasons.


OREODAPHNE, Mountain Laurel (from spinos, mountainous, and daphne, a laurel), a genus of plants belonging to the natural order Lauraceæ. It is hermaphrodite, dioecious, or polygamous, with 6-parted nearly equal calyx, the limb eventually disappearing. It has 9 stamens, oblong anthers, with narrow filaments, 4-celled, the inner looking outwards. The fruit is sucrose, in less intensity, or less intense, in the cup formed of the altered tube of the calyx. The flowers are panicked or racemose, axillary, and occasionally umbellate. O. opifera is native of the woods of Paris and the Rio Negro. It has less sugar. It is chiefly used in Brazil as a remedy in pains and contractions of the limbs. O. cupularis is a very large tree, with a strong-scented...
wood; it has ovate elliptical leaves, borne at both ends, sometimes blunt at the apex, ending in a channelled stalk, obliquely netted, smooth; the axils of the costal veins without pores. The flowers are in clustered few-flowered rough hoary racemes below the axillary and terminal bud. The calyx of the fruit is hirsute. This species is rare. *This is the Isle of France, where it grows, and also in Bourbon and Madagascar.*

(Lindley, *Flora Medica.*)

ORGANIC CHEMISTRY. [Timper, Animal, P.C.S.]*

ORGANON. *The article Organon in the P.C. contains a general view of the nature and object of logical science; and the article Stilling contains all that is necessary on that subject.* They will both be highly needed to complete what has been already given.

The *Elementa Logicae Aristotelicae,* by Professor Trendelenburg, Berlin, 1842, 2nd edition, consists of passages selected from the works of Aristotle, which passages may be considered as containing the elements of the science. These passages are so arranged as to present a kind of outline of the whole logical system of Aristotle. They are intended for the use of the higher classes in gymnasia, and as a preparation for philosophical studies.

The following article is simply a translation of these extracts, which are retained in the order given to them by Trendelenburg. In the places where references to the original works in Aristotle have also been retained. The original terms of Aristotle are also given in brackets the first time that each is mentioned.

In the preface to another useful work (Beiirirtungen zu den Aristoteleischen Rhetorischen Werken, Berlin, 1842, by the same author), he has more fully explained his views in making these extracts from Aristotle, and the following remarks are his: At the time of the Reformation Luther saw clearly the advantage of logical instruction in the higher schools, and he viewed it correctly as the completion of the grammatical instruction. The circle of studies in modern times has been wonderfully enlarged, and it has been found necessary to extend the school instruction to meet the wants of the present age. But the great variety of subjects with which our present systems of education occupy us, only render the more necessary to discipline the mind in such a manner that it shall see a unity in all that is presented to it, and not be bewildered by the variety of objects whose connexion escapes us, when they are contemplated separately. Such a discipline is furnished by a good course of elementary instruction in logic. For this purpose the author has adopted the genuine words of Aristotle, in which the philosopher has laid down his elementary logical principles. The logic of Aristotle is not antiquated, though it is both misunderstood by some and misused by others who do not understand it. It is not the formal logic of Kant, which would confine us to the forms of thought without any reference to the object into which the thought penetrates. Such a limitation of the subject matter of the science of Aristotle, as the author opposes to its real character. *We have,* says Trendelenburg, *attempted to restore this real character,* and thus brought Aristotle nearer to the objective demands of modern times. He has endeavoured to make the logic as purely formal, viewed in a different light, and they who may consider their mode of viewing the subject to be better than his. Those who say that Aristotle has, in some matters, erroneously extended the province of logic to things beyond its limits, and has not always kept close to the real subject. appear to have conceived that he viewed it merely as formal, and sometimes transgressed the boundaries of the science which he recognised. This is however an erroneous view of Aristotle's system.

The advantage of studying these elementary principles in the words of Aristotle is, that in his writings the language of philosophy is formed into a scientific terminology, which is the basis of that which we now use. We cannot therefore lay a sure foundation for our logical and philosophical studies on any other basis than a full comprehension of the meaning of Aristotle's terms.

The author remarks that a learner of logic there meets with those fundamental notions (begriffe) in their simple nakedness, which lie hidden in all our knowledge and govern it. As these notions are hid or concealed in our knowledge, they appear to the pupil when they are presented in their naked form. It is therefore the business of the teacher to show to the pupil their real significance, to make him see their actual value in their application. Now the instruction in the German gymnasia, which are the highest in Germany and Ireland, is in the learned languages and in mathematicae; and accordingly the teachers in both those departments, if they are to make use of such a work as Trendelenburg's, must be able to apply logical principles to instruction in language and in mathematics. To facilitate this method of instruction is the object of the learned author in the Illustrationen (Erklärungen) to the Elementary Logic (Elementarlogik), which is said to be this is precisely the form in which he supposes that they ought to be presented to the pupil, but 'merely to render clear the fundamental notion of the logical relationship in the objects of scientific observation.'

The mode in which the author suggests that his two works should be used is probably the best; but they cannot be used at all in ordinary instruction, except under the guidance of a competent teacher. They will be useful to those who have a competent knowledge of the Greek and German languages, and possess some elementary notions of logic; and those who cannot read Greek with facility will probably find the following translation sufficiently exact to give them the meaning of Aristotle. A translation of such extracts is not easy, and it is possible that there may be some errors in it. A careful study of these extracts however will convince a student how meagre and unsatisfactory an exhibition of the elementary principles of logic even our best works on the subject contain.

Outline of Logic.

(1.) In things in which there is a falsehood and truth, there is a composition of ideas as though they were one. (De Anim. iii. 6.) For falsehood and truth are concerned with composition and separation. Accordingly nouns and verbs by themselves alone can make no assertion, as 'man' or 'white,' when nothing is added: for there is so far neither falsehood nor truth. (De Interpret.) Consequently he thinks truly who considers that which is separated to be separated, and that which is compounded to be compounded; but he thinks falsely whose thoughts have a different relation from that which the things have. (Metaph. i. 10.)

(2.) All speech (λόγος) is significant, but not all enunciative (διαφωνητικός). Speech is not truth or falsehood. But it is not in all; for example, prayer is speech, but neither true nor false. The enunciative alone belongs to the present inquiry. (De Interp. c. 4.)

(5.) Of things said with no condition, each signifies either substance (ὑπόσως) or quantity, or quality, or relation, or where (space), or when (time), or position, or possession, or acting, or being acted on. And substance (ὑπόσως) is, to give an example, such as 'man,' 'horse,' etc., quantity is, such as two cubits, three cubs: and quality, such as white, grammatical: and relation, such as double, half, greater: and where, such as in the Lyceum, in the agora: and when, such as 'yesterday,' 'to-morrow': and possession, such as he has sheep on, he is armed: and acting, such as he cuts, he burns: and being acted on (εἰς ὑπόσως), such as he is cut, he is burnt. (Categ. c. 4.)

(4.) Of things said with condition, each signifies, the same, or is the same, or is not the same, or is not unlike, or is contrary, secondly a negation. And affirmation (αἰτιουμένος) is an enunciation of something towards another thing; and negation (ἀφάσις) is the enunciation of something away from another thing. And the same, or is the same, is another name for the universal, and Callias to the particular. (De Interp. c. 7.) A Proposition (στάσις) then is speech either affirming or denying something about something. And this speech is either universal or particular or indefinite. I call that universal which belongs either to all or to none; I call that particular which belongs either to some one, or not to some one, or not to all; and I call that indefinite which either belongs to some one, or to none, or not to all. (De Interp. c. 5. 6. 9.)

(5.) Not-man is not a noun; for indeed there is no name to call it by; for it is neither affirmative speech nor a negation. But let it be called 'name or noun indefinitely,' because it can be said equally of anything, both of what is and what is not. Every affirmation and negation will consist either of a noun and a verb or of an indefinite noun and a verb. But without a verb there is neither affirmation nor negation. (De Interp. c. 2. 10.)

(6.) Of things some are universal and some particular. I call that universal which can be said of more things (than one): and I call that particular which cannot: thus, man belongs to the universal, and Callias to the particular. (De Interp. c. 7.) A Proposition (στάσις) then is speech either affirming or denying something about something. And this speech is either universal or particular or indefinite. (De Interp. c. 7.)
if a man know that the angles of every triangle are together equal to two right angles, he know in a way that the angles of an isosceles triangle also are together equal to two right angles potentially (δύναμις), even if he does not know that the isosceles triangle is a triangle. But he who knows this proposition potentially, as well as every triangle, and a single thing, and what is an object of sense; but of these things others can be predicated (for each of these persons is both man and animal); and some things are themselves predicated of other things, but of them there is no further predication by other things; and some are both themselves predicated of others, and others of them, for example, 'man' is predicated of 'Callias,' and 'animal' of 'man.' Accordingly there are some things which exist which cannot be predicated of anything is manifest. For of sensuous objects nearly every one is such that it can be predicated (ἐπιτρέπει) of nothing. (Anal. Pr. i. 27.)

The genera are predicated of the species, but not the converse, the species of the genera. (Categ. c. 5.)

(9.) It is impossible for the same thing at the same time to be and not to be possible, i.e. to be and not to be at the same time. This indeed of all principles is the most certain; for it is impossible for any one to conceive that the same thing is and is not. Wherefore all who demonstrate, cast down their demonstration (διά τὸ διάταγμα) to this ultimate notion. (Metaphys. iv. 3.)

Every thing which is true must agree with itself in every way: for with truth all which is true is in harmony, but with falsehood the truth is at soon variance. (Ethics. Nic. i. 8.)

(10.) And since it is possible for what belongs to be enunciated as not belonging, and what does not belong as belonging, and what does not belong as belonging, and with respect to other times than the present in like manner, it is possible to deny both that a man has affirmed, and to affirm what he has denied. So that it is manifest that to every affirmation a negation is opposed, and to every negation an affirmation; and let the contradiction (διαταγμα) be this, affirmations and negations opposed. And I call opposition (διαταγμα) the contradiction of the same thing about the same thing, but not ἐπιτρέπει: (Comp. Categ. c. 6; De Interp. c. 6.)

Contradiction is opposition (διαταγμα) in which there is no man in itself. And as parts of contradiction, there is on one side affirmation and on the other side denial, nor is there anything denying something from ἄνυδος something. (Anal. Pr. i. 2.)

In affirmation and negation always, whether it is a thing that exists and is not existent, the one will be false, and the other true: for of the two, the Socrates and that Socrates is not sick, when Socrates exists it is manifest that one of them is true and the other false, and if he does not exist in the same manner: for that he is sick, when he does not exist, is false, and that he is not sick is true.

Accordingly, as these things alone, which are opposed as affirmation and negation, it will be peculiar for one of them always to be true or false. (Categ. c. 10.)

(11.) Things included in the same genus which differ most from one another, are defined to be contrary (ἐναντίως). (Categ. c. 6.)

I therefore say that affirmation is opposed to negation in the way of contradiction, when the one signifies that a thing is universal and the other signifies that the same is not universal: as for example, every man is white—but not every man is man; no man is white—a certain man is white. And I say that the universal affirmation and negation are opposed as contraries: as for example, every man is white—no man is white; every man is just—no man is just. Therefore it is not possible for these to be true at the same time. (De Interp. c. 7.)

(13.) And I say that propositions opposed are in common expression (ἐκατ' ἄλλος) four—namely, all and none, all and some, some and none, and in truth some for some is opposed to not some merely in expression. And of these three propositions the universal, all and none, are contrary; for example, all knowledge is excellent, no knowledge is excellent; but the other propositions are opposed (as contraries). (Anal. Pr. ii. 15.)

(14.) And since every proposition is either of being or of necessarily being or of the possibility of being, and of these some are affirmative and some negative in every mode, and again of the affirmative there is universal and particular, and of the negative some are universal and some particular and some indefinite, of necessity the proposition which is universally negative can be converted (ἐπιτρέπει) in its terms (ἐπιτρέπει): for example, if no pleasure is a good thing, neither is any good thing pleasure; but the affirmative proposition must be converted, not indeed universally but particularly; thus if all pleasure is good, some good also is pleasure. And of particular propositions the affirmative proposition must be converted, not particularly, for if some pleasure is good, some good also is pleasure: but as to the negative, it is not of necessity, for, if 'man' does not belong to (cannot be predicated of) some animal, it does not follow that 'animal cannot be predicated of some man.' (Anal. Pr. i. 2.)

(15.) The things which are sought are equal in number to the things which we know. And we seek four things—the That, the Why, If it is, What it is. For when we seek whether this or that is, referring it to number, for example, whether the sun is eclipsed or not, we seek the That. And there is proof of this, for when we have found out That it is eclipsed we cease inquiring; and if from the beginning we know That it is eclipsed, we do not inquire whether it is. And when we know that it is, we inquire the Why: for example, that the sun is eclipsed, when the earth moves, we inquire why the sun is eclipsed or why the earth moves. These things accordingly we inquire after thus; but some things we inquire after in another manner, as for example, whether or not it is true. And so, unless it is simply mean if there is or is not, but not if he is white or not. And when we know that there is, we inquire what It is, for example, what is God or what is man. (Anal. Post. iii. 1.)

(16.) To know That a thing is and to know Why it is are different; and the knowledge of the Why refers to the first cause. The chiefest of knowledge is to contemplate the Why. (Anal. Pr. ii. 1.)

(17.) And we think that we know each thing simply when we think that we both know the cause by which the thing is, that it is its cause, and that it cannot be otherwise. (Anal. Post. i. 2.)

(18.) All instruction and all rational learning come from knowledge preceding. And this is manifest to them who contemplate all (sciences); for both those of the sciences which are mathematical by these means exist, and every one of the other arts. (Anal. Post. i. 1.)

(19.) And things are prior and better known in two ways: for it is not the same thing to be prior by nature and prior as something else. Let us regard as it seems to be the better known: for example, the sun is better known by us. And I call those things prior and more known as regards us which are nearer the sense, but I call simply prior and more known as regards us which are from the conception. And the farthest off are the least universal, and the nearest the particular. (Anal. Post. i. 2.)

(20.) We get certainty in all things either by syllogism (συλλογικῶς) or by induction (ἐπιτρέπει). (Anal. Pr. ii. 23.)

We learn either by induction or demonstration (ἐπιτρέπει) and demonstration proceeds from the general, but induction from the particular. (Anal. Post. i. 18.)

(21.) And syllogism is speech, in which when some things are laid down, something else different from what are laid down results by virtue of their being laid down; and by virtue of their being laid down: I mean that it is through them; and I mean by resulting through them, that there is no need of any external term for the necessity to be. (Anal. Pr. i. 1.)

(22.) And I call Term that into which the proposition is resolved, as the predicate and the thing of which it is predicated (subject). (Anal. Pr. i. 1.)

(23.) Whatever so affirmed of the predicate, will be affirmed of the subject. (Categ. c. 6.)

(24.) When three terms are so related to one another that the last is in the whole of the middle, and the middle is either in or not in the whole of the first, and there is there is a perfect syllogism of the extremes. And I call middle that which is both itself in another and in another, and which also by position becomes middle: And I call extremes both that which is in another, and in another the
is. For if A can be predicated of all B, and of all C, necessarily -A can be predicated of no C. And I call a figure (εὑρίσκω) of such description the first. (Analyt. Pr. i. 4.)

(25.) And when the same thing belongs to all of one thing and to none of another, or to all or none of each, such a figure I call the second, and which is predicated of both or none of the middle terms, which in the terms is placed without the extremes (ὅποια), but the first in position —And a syllogism will be possible both when the terms are universal and when they are not universal. When they are universal, if the middle term is a syllogism: of one, and in none of the other, if the negative be in one of the two terms: but otherwise the syllogism cannot be.

For let M be predicated of no part of N, but of all X. Since then the negative proposition can be converted, N will belong to no part of M: but M by the supposition was predicated of all X. Accordingly N will be no part of X: for this has been shown before. Again, if M shall belong to all N, but to no part of X, neither will N belong to any part of X: for if M belongs to no part of X, neither will X belong to any part of M: but M by the supposition belongs to all N. Therefore, if X will belong to no part of N: for this also has become the first figure. And since the negative proposition is convertible, neither N will belong to any part of X, so that there will be the same syllogism. An affirmative cannot be produced by a figure, but they are all negative, both the universal syllogisms and the particular syllogisms. (Analyt. i. 5.)

(26.) But if one thing belongs to the whole of the same thing as another has no part, or both to part of the whole or to no part, such a figure I call the third; and I call that the middle in it of which both the predications are made, and I call the extremes the predications:—And the middle is placed without the extremes, and last in position—And a syllogism will be possible both when the terms are universal and when not universal with reference to the middle. Accordingly if they are universal, when both P and R belong to all S, and Q belongs to some part of R, or is of necessity belongs to some part of R: for since the affirmative is convertible, S will belong to some part of R, since S belongs to all of S, and S belongs to some part of R: for the syllogism is produced by means of the first figure.

To form a syllogism universally by means of this figure is not possible, neither in the negative nor in the affirmative. (Analyt. Pr. i. 6.)

(27.) And it is manifest that every demonstration will be by means of three terms and not more. And since this is clear, it is manifest that it consists of two propositions and not more: for the three terms are two propositions. (Analyt. Pr. i. 36.)

(30.) It is necessary in all the figures that the middle be in both the propositions. If then the middle term both predicated and subject of predications, if it itself predicated, and anything is denied of it, it will be the first figure, but if it both predicates and is denied of something, it will be the middle figure: and if other things are predicated of it, or one thing of another, if it is predicated of it, it will be the last figure. (Analyt. Pr. i. 82.)

(28.) Moreover in all syllogisms one of the terms must be affirmative and it must be universal: for without the universal there will either be no syllogism, or it will not relate to the thing proposed, or the very thing to be proved will be assumed. For let it be proposed to prove that music is an honourable pleasure: if then any one should assume that pleasure is honourable without asking the 'all,' it will not be a syllogism: and if he should assume that some pleasure is excellent, if he means other pleasure, it has nothing to do with the subject proposed, and if he means the very pleasure itself, he assumes the very thing which is to be proved. (Analyt. Pr. i. 24.)

(30.) The science of what a thing is, it is possible to investigate by means of this figure alone (the first). For in the mind it is possible to separate the like things from the unlike (ὁμογένεια) what science is, requires the affirmative: and in the last figure there is a syllogism, but not a universal syllogism, and the question what a thing is, belongs to the universal. (Analyt. Pr. i. 25.)

(31.) All who attempt to syllogize from things less credible than the conclusion, manifestly do not syllogize rightly. (Top. i. 4.)

(32.) From what is true it is not possible to form a false conclusion, but from what is false it is possible to form a true conclusion; not however 'why' but 'that' the thing is. (Analyt. Pr. ii. 2.) Accordingly it is manifest that, if the conclusion be false, of necessity those things are false either wholly or partly. And particularly, the argumentation of the first mode is, when the conclusion is true, it is not matter of necessity for either anything or all to be true, but it is possible when none of the things in the syllogism are true, for the conclusion not to be true. And in the third mode, when the middle term is of one, and in none of the other, if the negative be in one of the two terms: but otherwise the syllogism cannot be.

And speech is called false in one manner, when it appears to be conclusive but is not conclusive which which is called intuitive syllogism (φυσικά καταλήγουσα). (Top. viii. 12.)

Contentious speech is the syllogizing from notions that appear to be common notions, but are not; or it is merely apparent reasoning not from premises. (Top. viii. 5.)

The equality of opposite arguments (ανθώρων) would appear to be productive of doubt. (Top. vi. 6.)

(34.) Induction (αναγκή) is the progress from the particular to the universal. And if someone is to be told the principle: and if a charioteer who is skilled is so, universally also the person who is skilled in each thing is the best. And induction is the more persuasive and more credible, and more intelligible to sense, and in value among the many: but the syllogism has more force and is more effective against opponents in argument. (Top. i. 12.)

(35.) Induction then and the syllogism from induction, is through one, or but is not the induction of the middle term; for example, if B is the middle term of A and C, by means of C to show that A may be predicated of B: for thus we make inductions. — But C must be considered as composed of all things individually: for induction is made through all. (Analyt. Pr. ii. 23.)

(36.) In a manner induction is opposed to syllogism; for the one (syllogism) by means of the middle term proves the first term to be predicated of the third, but the other (induction), by means of the third term, proves the first to be predicated of the middle term. Naturally then the syllogism through the middle term is prior and more familiar; but to the syllogism through induction is the clearer. (Analyt. Pr. ii. 28.)

(37.) Probable (εἰκός) and Sign (εἰρωτός) are not the same, but εἰρωτός is a proposition conformable to opinion for what for the most part men have been in the habit of approving: in a particular way or not produced, or to be or not to be, this is probable; for example, that men hate the envious, or like the wise. But the syllogism, when a proposition is given and when a sign to opinion: for if when anything is, the thing is, or when anything has happened, the thing happens before or after, this is a sign of the thing having happened or being. (Top. i. 6.)

Enthexmena then (ενθοσύνεια) is a syllogism from probables or signs. (Analyt. Pr. ii. 27.)

(38.) And an example is, when the first is shown to belong (εἰκός) to the middle through one the last. But it must be known that both the middle belongs to the third and the first to the like. For example, let A be bad, and B be to take up war against neighbours; and C, the Athenians, taking up war against the Thebans; and D, the Phocians, taking up war against the Phocians. If then we wish to show that to make war on the Thebans is a bad thing, we must assume that to make war on neighbours is bad. And the evidence of this is the opinion of the Athenians, because the man who makes war on the Thebans against the Phocians is bad. Since then to make war on neighbours is bad, and since the war against the Thebans is against neighbours, it is manifest that to war against the Thebans is good. According to this: if B belongs to C and to D (for both C and D are to take up war against neighbours), and that A belongs to D (for the war of the Thebans against the Phocians was not good); then that B belongs to C is shown through B.

And in the same manner also if through more like things,
(45.) The object of science and science differ from the object of opinion and opinion, in as much as science is universal and is of necessity, and the necessary can not be otherwise, but opinion is unsatisfied in the opinion. And (46.) Induction is not possible when there is no sensuous perception; for sensuous perception belongs to the particular. Nor yet through science; for science is impossible to have sensuous perception of, for it is neither any particular thing nor; for, if it were, it would not be universal; for we can not form that the sensuous and the essentia of it. Wherefore also if we were in the moon and saw the earth intercepting the light of the sun, we should not know the cause of the eclipse, for we should perceive that it is eclipsed now, but we should not know why at all, for there would be no sensuous perception of the universal. (Analyst. Post. i. 18, 31.)

(47.) And I call universal whatever belongs to all both of itself and in itself. It is manifest that whatever is universal of necessity belongs to the things. And the of itself and in itself are the same; for example, of itself a point belongs to a line insmuch as it is a line; and to a triangle, inasmuch as it is a triangle. But of itself the same, and of itself of the triangle (as to equals) is equal to right angles. And the universal then, when it can be demonstrated of any individual (of the class) and of no class prior to that, (Analyst. Post. i. 18, 31.)

(48.) To what thing anything of itself belongs, that thing it is its own cause (de.eo); and the universal is first, therefore the universal is the cause. (Analyst. Post. i. 24.)

(49.) Universally, of all things it is impossible for there to be demonstration; for it would proceed indefinitely, so that thus there would be no demonstration at all. (Metaph. iv. 4.) And it is not possible for the thought to go through the infinite. (Analyst. Post. i. 24.)

(50.) And those things are true and first which not other things, but through themselves receive asent; for it is not necessary in scientific first principles for the 'wherefore' to be inquired after, but each of the principles must itself of itself receive asent. (Top. i. 1.) And in two ways it is necessary first to know: for as to some things it is necessary first to admit that they are; but as to others it is necessary to understand what the thing spoken of is; and as to others again both; for example, in the proposition that either to affirm or deny every thing is true, we must assume the 'is'; and in the triangle, that it signifies this particular thing; and in the monad, both, what it means and that it is. (Analyst. Post. i. 1.)

(51.) But we assert that all science is not demonstrative, but that of the immediate (σωφρον) is incapable of demonstration. And that of the immediate is admitted of itself of itself, in so far as it is necessary to understand the principle things of the proposition comes, and the immediate at that time goes into the demonstration, it is manifest of necessity that the immediate are not capable of demonstration. And this then we so affirm, and that there is not only science, but also science of first principle (ὑπόδεικνυμαι) of science by which we know the terms (ἐνοχῇ). It is necessary not only to know first the things, either all or some, but also to know them more; for always through which each thing is, is more (in a higher degree); for example, that through which we love, is more love. So that if we know by the first things and believe, those things also we know and believe more, since by them we know also the things which come after. (Analyst. Post. i. 3, 2.)

(52.) And an immediate proposition (προτέρως) is a beginning (ὑποδεικνυμα) of demonstration, and an immediate proposition is that to which there is no prior proposition. (Analyst. Post. i. 2.)

(53.) And of the immediate syllogistic beginning I call that the Thesis which need not be demonstrated, and which it is not necessary that he who is going to learn anything should possess; but what he who is going to learn anything must necessarily possess, is an axiomatic (διαπρώτα). (Analyst. Post. i. 2.)

(54.) The first things will be definitions (ὅροις) incapable of demonstration. For definition is of what the thing is and of essence; and all definitions are hypothesis and to assume what a thing is, for example,
mathematical demonstrative case for granting what a unit is and what odd is, and other kinds of demonstration in like manner.

The definition is a certain notification (γνωματική) of essence. (Analyst Post. ii. 3.)

A science shows either what a thing is or what the name means. (Analyst Post. ii. 7.)

All who in any way by a name give an account of a thing, manifestly do not give the definition of the thing, since every definition is a notion (λόγος). (Trop. i. 5.)

What a triangle means, the geometer assumes; but that it is, he proves. (Analyst Post. ii. 7.)

(56.) And it is necessary to investigate, when considering things, whether they do not differ in the first place what they all have in common, then again with respect to other things what things they have which are of the same genus as the former, and are the same one another in species, but different from the first named. And when in these things it has been found what they all have in common, and in the other things in like manner, we must consider again if there is anything in common in these things which have been taken, until you come to one notion (λόγος): for this will be a definition of the thing. But if a man does not come to one notion, but to two or more, it is manifest that what they all have in common cannot be one but more than one for example, if we should inquire what magnanimity is, we must consider in the case of some magnanimous persons whom we know, what one thing they all have by which they are such. For magnanimity is magnanimity of Ajax, and of Achilles, and of Ajax, what one thing they have in common? Non-endurance of insult: for the first made war, and the second was enraged, and the third killed himself.

If notions of others, such as Lycurger or Socrates; if indifference in prosperity and adversity are the things that they have in common, these two things I take and consider what same things are contained in the absence of all feeling (άσκεσις) as to fortune, and non-endurance of insult. If they have nothing in common, there must be two species (τύποι) of magnanimity. (Analyst Post. ii. 13.)

(57.) Of the things indeed which are in the definition each one is a notion, but all will not extend further. For of necessity there must be this essence (ονήμα) of the thing: for example, there is number in every Three (τρίαδα), odd (ετεροτρία), and the prime in both ways, both as not to be measured by any number and not to be composed of numbers. This then is Three, number odd, and prime, and prime in this manner: for of each of these things some are in all odd numbers also, but the last is in Two also, but all are in none. (Analyst Post. ii. 13.)

(58.) And it is necessary, when a person is labouring at any whole thing, to divide the genus (γένος) into things indivisible in species, the first; for example, to divide number into even and odd. (Analyst Post. ii. 13.)

All genus is divided by differences which are opposed to one another in division, as a living animal by the difference of quadruped and bird and fish. (Trop. vi. 6.)

It should fall under no extension, if they be things opposed in which there is no middle, is not an assumption, for it is necessary that everything should be in one of them, if there should be a difference (διαφόρον) in it (the genus). (Analyst Post. ii. 13.)

It is requisite moreover to divide by privation (ερίσεως), and those cut into two parts divide by privation. And there is no difference in privation, so far as it is privation, for it is impossible that there should be species of a thing which does not exist; for example, of animals without feet or animals without wings, as there is in the case of winged animals and quadrupeds. (De Fertil. Anim. i. 3.)

(59.) Definition consists of genus and differences. (Trop. i. 5.)

It is requisite that he who defines well define through genus and differences, and these belong to those things which are in a certain way prior to the species (τύποι). And there are three ways in which the definition is not from prior things. The first is, if through what is opposed that which is opposed is defined; for example, if through evil, what is opposite to evil for the opposite is the nature. But to some the knowledge of each of them appears to be also the same, so that neither is one better known than the other. But it should not escape notice that some things perhaps it is not possible to perceive, or otherwise, for the doubles without the half, and all those things which of themselves are said in relation to anything (ἐκ τοῦτο): for in all such things to be is the same thing as to be related to something in some manner, so that it is impossible without the one to know the other; wherefore it is necessary in the notion (λόγος) of the one that the other also be included.

Another way is, if a man uses the very thing which is defined. But this escapes notice, when he has not used the name itself of the thing defined; for example, if he defined the sun to be a star which appears in the day time; for he who employs the word day employs the word sun. And it is required in order that such things may be defined, to exchange the name (ἐπωνύμως) for the notion (λόγος, λόγος), for example, that day is the passage of the sun above the earth: for it is manifest that he who has spoken of the passage of the sun has also mentioned the sun. So that he who has employed the word day has employed the word sun. A third way is, if that which is opposed in division is defined by that which is opposed in division, for example that odd is greater than even by a unit. For things of the same genus opposed in division exist by nature, and odd and even are opposed in division: for both are differences of number. (Trop. vi. 4.)

To know what a thing is, is the same as to know why it is. What is an eclipse? Privation of light from the moon through the earth intercepting the light.) What causes a conflagration? Privation of the sun and the light falls, owing to the interposition of the earth. What is symmetry? A proportion (λόγος) of numbers in sounds high or deep (ψύχων, ψυχή). Why is the high symmetrical with the low? Because of the proportion of high and deep. Hence it is a proportion (λόγος) of numbers. (Analyst Post. ii. 2.)

(60.) We seek the cause after we know that a thing is; but sometimes they are manifest at the same time also; but it is not possible to know the cause before we know that what thing exists. (Analyst Post. ii. 8.) For it is impossible to know what a thing is when we are in ignorance whether it exists or not.

And both the notion or expression (λόγος) appears to give evidence to phenomena, and phenomena to the notion. (De Coel. i. 3.)

(62.) The cause is the middle (μέσον), and in all things this is sought to be known before we know the cause. (63.) Not only that a thing 'is' ought the definition (ἀποδεικτικός λόγος) to show, as the most part of definitions declare, but the cause also ought to be in it, and to be clear. But the notions of the definitions are as conclusions: for example, what is quadrature? It is a rectangular equilateral figure being equal to a figure of unequal sides. And such a definition is an expression of the conclusion. But the definition which says that quadrature is invention of a middle, states the cause of the thing. (De Animal. ii. 2, § 1.)

(64.) And it appears that not only what a thing is, is useful towards knowing the causes of the accidents of essences (καθαρτικός λόγος), but also the cause (καταλαβεῖν) of an accident (καταλαβεῖν) of an accident is most useful, when a straight line is and what a curved line is, or what a line and a plane are, is useful towards seeing how many right angles the angles of a triangle are equal to, but conversely also the straight line and the plane are ground of the cause of that thing is: when we are able by the appearance (φαινόμενον) to give an account of the accidents either of all or of the greater part, then concerning the essence also we shall be able best to speak: for of all demonstration what a thing is (οἷον εἴσται), is the beginning. So that in all definitions in which it does not happen that we can recognise the accidents, and cannot even form a conjecture of them easily, it is manifest that they are all enunciated dialectically (διαλεκτικός) and emptily (σωματικός). (De Animal. i. 1, § 8.)

(65.) And of some things some other thing is the cause, and of other things not.

Accordingly manifest that of those also which belong to the class of what a thing 'is,' some are immediate (Διάφωσις) and first principles (τέχνη), which we must assume (πρωτεύοντα) both to be, and we must assume what they are, or in some other way make clear which the archetypal does for both what unity is and that it he assumes. But as to those things which have a middle (μέσον), and of which we have said a little, there is the cause of the essence, we can, as we have said, show by the definition (λόγος) which the archetypal does for both what unity is and that it he assumes. But as to those things which have a middle (μέσον), and of which we have said a little, there is the cause of the essence, we can, as we have said, show by the definition (λόγος) which the archetypal does for both what unity is and that it he assumes. But as to those things which have a middle (μέσον), and of which we have said a little, there is the cause of the essence, we can, as we have said, show by the definition (λόγος) which the archetypal does for both what unity is and that it he assumes. But as to those things which have a middle (μέσον), and of which we have said a little, there is the cause of the essence, we can, as we have said, show by the definition (λόγος) which the archetypal does for both what unity is and that it he assumes. But as to those things which have a middle (μέσον), and of which we have said a little, there is the cause of the essence, we can, as we have said, show by the definition (λόγος) which the archetypal does for both what unity is and that it he assumes. But as to those things which have a middle (μέσον), and of which we have said a little, there is the cause of the essence, we can, as we have said, show by the definition (λόγος) which the archetypal does for both what unity is and that it he assumes. But as to those things which have a middle (μέσον), and of which we have said a little, there is the cause of the essence, we can, as we have said, show by the definition (λόγος) which the archetypal does for both what unity is and that it he assumes. But as to those things which have a middle (μέσον), and of which we have said a little, there is the cause of the essence, we can, as we have said, show by the definition (λόγος) which the archetypal does for both what unity is and that it he assumes.
tion is proposition (δύναμις); for the arithmetician lays down (ποιεῖ, πόσα, πόσον) that the unit is indivisible, as far as quantification is concerned; it is not the case that a whole number is something in which a unit is and that there is a unit not the same thing. (Analys. Post. i. 2.)

(67.) All demonstrative science is about three things, two of which concern the propositions and one that concerns the affections (νοηματικά) of which by themselves it contemplates, and what are called common axioms (διάλεξις) from which first principles science demonstrates; and thirdly, the affections (δεικτικα) of which what each means it takes for granted. (Analys. Post. i. 10.)

(68.) It is clear that it is not possible to demonstrate the peculiar first principles of each thing: for those first principles of each thing about which each man knows in common knowledge, and of those is that which is supreme over all. For he knows more who knows from the higher causes: for he knows from the prior when he knows from causes which depend not on other causes. So that if he knows more and more, then science also will be both more and most. (Analys. Post. i. 9.)

(69.) Accordingly it is impossible to science from demonstration, if a man does not know the first principles which admit of no middle (κατὰ τὸ κατάτατον), but as to the knowledge of things which want a middle, a man may be in doubt. All animals have an innate discerning faculty, which men call perception (αἴσθησις). As and they have in common knowledge of the thing perceived (αἴσθησιν) and in others there is not. In those animals, then, in which it is not, there is either wholly, with respect to things of which there is no perception in them, a lack of knowledge except in so far as they receive: but in those animals in which there is, there is the faculty of having the perception in the mind, though they do not then perceive it. And many animals being such, there results a difference among them, so that they have reason owing to the permanence of such things, and some have not. Accordingly from perception comes memory (μνήμη), as we call it, and from the frequent remembrance of the same thing comes experience (εμπειρία): for many remembrances in number are one experience. And from experience, or from a whole thing remaining tranquil in the mind as one thing apart from the rest of all things is as one and the same thing, is the beginning of art and of science; if about production (παραγωγής), of art; if about that which is or being (εἶναι, τὸ σώμα), of science. Neither indeed do the faculties (εἶδος) exist in the mind separate, nor do they proceed from other faculties which are more intelligent, but they proceed from perception; as in battle a flight has taken place, when one stops, another stops, and then another, until order is restored to the army. For each faculty is a family of something that is a faculty of being so affected. For when one thing of things which are not different stands, it first of all is in the mind as universal (for the mind perceives the individual, but the perception belongs to the mind), just as the angels are compassed close by the multitude, but not to a man (κόιλος): and again it abides in these until the undivided and the universal have abided: for example, such or such an animal abides, until animal generally abides; and many men have experienced such and such a thing. It is manifest that it is necessary for us to know the first things by induction: for perception also in this manner produces the universal in the mind.

And since of the faculties that concern the understanding (εἴδος), by which we learn the truth, some are always true, and some admit of falsehood, as opinion and reasoning (λόγιον ἐν λόγῳ); and since science and intellect (ἐπιστήμη καὶ σοφία) are always true, and there is no other kind of science more exact than intellect, and since the first principles are clearer than the demonstrations, and since all science is together with reason (λόγιον),* there can be no science of the first principles of each thing. The intellect, intellect must be intellect of first principles: and this appears both from considering these things, and that the beginning of demonstration is not so, therefore science is not the beginning of knowledge. For of no kind of truth which exists independent of science, intellect (σοφία) must be the beginning of science. (Analys. Post. ii. 19.)

ORES, DRESSING, &c. OF. [Mining, P.C. pp. 236, 240, 241; Cooper, P. C., p. 505; Tim, Manufacture of, P. C., p. 471.]

* The word λόγος is rendered 'ratio' by the Latin translation. Trendelenburg translates the passage thus: 'jede Wissenschaft aber mit einem grundsätzlichen Unterschied; das wollte man nicht unerwähnt lassen.' It may be understood as in No. 2. Argynus should be related to λευκής as ἡ τιμία to τιμία (telling, tending) to τίμιον (holy, venerable).
flowers, the peduncles longer than the linear lanceolate bracts, lanceolate simple filaments, linear glabrous barbs. The flowers are white, with a broad green longitudinal band externally. It is found in meadows and pastures in Great Britain, and is the _species_ of _Theophrastus_, _Hist. Plant._ 7. 2. 178; and the Bobbin alba of Pliny, 29. 6.

*O. pyramica*, Spiked Star of Bethlehem, has flowers in an elongated raceme; the peduncles at first spreading, after-what they are held erect; the flowers are disposed below with an elongated point. The flowers are of a greenish white, the segments of the perianth variable in breadth. The leaves wither before the stalk appears; they are lanceolate, serrate, short-petioled, and capitate at the top. It is easily distinguished from _O. alba_, and is common in Wiltshire, Bath, and in Sussex and Berkshire. This species is the _species_ of _Theophrastus_, _Hist. Plant._ 7. 10. 7. 11.

*O. mutans* has but few leaves in a lax nodding raceme; the peduncles shorter than the bracts; the flowers flat, membranous, and trifid; the lateral points acute, the middle one very short, bearing the anther; the leaves linear lanceolate; the flower large, white, and greenish externally. It is occasionally found in fields and orchards in Great Britain. It is the _species_ of _Diocereus_, 2, 201.

*O. maritima*, Squill, is described under _Squilla_, P. C. and _Scilla_, P. C. (Lindley, _Flora Medica_; Babington, _Manual of British Botany_; Burnett, _Outlines of Botany_; Fras, _Synopsis_, &c.)

**OBNUS.** (FRAZUS, P. C.)

**ORBANCIUM** (from *sponio*, a kind of vetch, and _spyrw_, to envelop, because the species grows on the roots of vetches, and were supposed to destroy them by strangulation), a genus of plants, the type of the natural order Orbanaceae. It has 2 lateral, undivided or cloven permanent sepals; a ring of withering corollas, the upper lip concave, notched, the lower reflexed, in three unequal wavy lobes; a gland under the ovary; the anthers sagittate with the lobes pointed at the base; the filaments almost as long as the lobe of the corolla, downy and anthers; the capsule ovate, pointed with 4 parietal parallel placents. The species are paraerect, usually simple, rarely branched, scaly erect herbs.

*O. macroscopos*. Greater Broom-Rape, has the sepal 2-nerved equally bid, nearly as long as the tube of the corolla, the corolla bull-shaped, vescicose at the base, in front arcuate; the lips wavy, obsolete denticulated (not fringed), upper lip helmet-shaped, scarcely emarginate; sides patent, middle lobe of the lower lip much longer than the lateral lobes; the stamens inserted at the base of the corolla, glabrous below, their upper part and the style glandular pubescent. This plant is a native of Europe, growing parasitic upon broom, furze, and other shrubs belonging to the _Furcales_ on a barren and dry soil. It is abundant in some parts of Great Britain. This plant is very bitter and is a powerful astringent. It has been used as a dye, in the production of other dyes, and applied externally as a deterrent to foul sore.

*O. minor*. Lesser Broom-Rape, has the sepals many-nerved, the lobes of the lower lip equal, the stigma bi-lobed. The lower lip purple, the stigma yellow when dry. It is found in Europe parasitical upon the roots of the _Timobium pratense_. Although it is sometimes very abundant, it does not appear to injure the crop of clover. It is constantly found in many parts of England with the clover crops.

*O. rubra* has the corolla glabrous, pubescent externally, and the upper lip internally, the lips acutely denticulated, the stamens inserted near the base of the corolla. It is a native of the north of Ireland and of Cornwall in England. It is a sweet scent, and is found parasitical upon the _Thymus serpyllum_, Thyme.

*O. carpophylla* has the corolla tubular, bell-shaped, curbed, on the upper lip 3 lobed, toothed; the flowers inserted above the base; the corolla hairy within. The stigmas are of a dark purple, the anthers at first purple, yellow when dry. It has been found in Siberia and Italy, and on the Himalaya. It has been found also in England, where it is parasitic on the roots of _Galium Mollugo_.

*O. dactylus* has the corolla curved, tubular, slightly compressed above; the upper lip 2-lobed, toothed; the lobes inflexed; the margin toothed, in dyer's recipes, inserted above the base; the corolla scabrous. It grows in Great Britain, but is a rare plant.

*O. barbata* has the middle lobe of the lower lip of the corolla bright yellow. Found in Europe, parasitical upon ivy (Hedera Helix). Two other British species, _O. caerulea_ and _O. ramosa_ are described by Babington. These are referred by many systematists to the genus _Orobanche_, and _Orobanche_ is distinguished from _Orobanche_ by the possession of a tubular bibracteate, 4-5-toothed or 4-5-cleft calyx. _P. coerulea_ has a calyx of 4 sepals, tubular, with triangular subulate tooth shorter than the tube of the corolla; the corolla tubular, slightly curved in front, the middle of the tube compressed on the back; the throat slightly inflated externally; glandular lobes of the lips oblong with reflexed margins, lower lip hairy within, nature of the anther hairy. It is found in the north of Germany and the south of France. It has been rarely found in Great Britain in the fields of Hampshire and Norfolk, and in Jersey. The flowers have a bluish colour. It is parasitical upon _Achillea_ and _Spartium_. There are several other species of _Phelippea_, which were formerly described as belonging to the genus _Orobanche_. All the plants belonging to _Orobancheaceae_ have the habits and general character of _Orobanche_. The genera belonging to this order are distinguished as follows:

**Tribe I.**

**Orobancheae.** Parasitical leafless herbs.

1. **Orobanche.** Calyx bracteolatus, somewhat 1-2-parted.
2. **Phelippea.** Calyx tubular, bibracteate, 4-5-toothed or 4-5-cleft.
3. **Amphilophyllum.** Calyx bracteolatus, 4-cleft, sub-bibracteate.
4. **Bochkenia.** Calyx truncate, unequally 5-toothed.
5. **Camphora.** Calyx ventricose, 5-parted, bibracteate, corolla incurved; upper lip entire, lower one bifid.
6. **Epipogium.** Calyx 5-cleft, tubular, bibracteate.
7. **Lambro.** Calyx bibracteate, campanulate, 4-cleft.
8. **Hyobanche.** Calyx tubular, 7-cleft, unequal, bibracteate.
9. **Aeolus.** Calyx bibracteate, bracteolus; upper lip 2-cleft, lower one entire.
10. **Equisetum.** Calyx spathaceous, capsule many-celled.
11. **Amblystegium.** Calyx campanulate, 4-cleft, both lips of corolla entire.

**Tribe II.**

**Orobolae.** Terrestrial leafy plants.

12. **Orobolus.** Calyx 5-cleft, bibracteate, corolla campanulate.
13. **Tussia.** Calyx 5-toothed, bracteolus (7) corolla ringent, tubular; capsule 1-seeded by abortion (7)

(Don, _Gardener's Dictionary_; Lindley, _Vegetable Kingdom_; Babington, _Manual of British Botany_.)

**ORBUS.** (Vieche, P. C.)

**ORIS ROOT.** (Irish, P. C. S.)

**ORSOVA.** (Servia, P. C.)

**OBTN.** A genus of plants belonging to the natural order Filices, and to the sub-order Ombilicaceae. It has clustered these arranged in a branching spike terminating the frond.

*O. scopala*, the Flowering Fern, has bipinnate fronds, pinnales oblong, nearly entire, dilated, and slightly suriicted at the base; the clusters panicled, terminal. This fern is a native of Great Britain in boggy places, and often attains a height of from 1 to 8 feet. It is very common in many parts of England, and especially on the lakes of Killarney in Ireland. It is common throughout Europe, and a plant of the same name is found in the United States.

(Babington, _Manual of British Botany_; Newman, _British Fern_.)

**OSSIFEROUS BRECIA, OSSIFEROUS CAVERNS.** The existence of large fissures and caverns in the rock is a fact known to miners and quarrymen in all parts of the world; that these cavities are frequently filled with stalactitical sparry and earthy accumulations, and sometimes with the bones of animals, is another fact on which modern geologists have based a long train of ingenious inferences. Fully to examine these facts and inferences would be to discuss one of the most comprehensive and unsettled problems of geology; it is possible however to present in a small compass the leading conclusions arrived at, and the inferences drawn from them.

Great fissures and caverns, though not absolutely confined to limestone rocks, are yet by far of most frequent occurrence in these deposits. They are not common in all limestones, but have been observed in limestone of various positions which they occupy. It is peculiarly in thick masses of limestone, (whether magnesiforous or purely calcareous)
that we find great caverns in England, Ireland, France, Belgium, North Germany, the Tyrol, Carinthia, Italy, Greece, North Africa, North America, and South America. It is sometimes observed that great cavities abound in limestone rocks, not so much at near to points and lines where the ordinary position of the strata is violently disturbed by faults, or fissures, or through the accumulation of water. For while the numerous caverns of Derbyshire and Yorkshire, and the Mendip Hills, are situated in or near to situations of violently disrupted strata, and by accumulating observations of this nature are gradually come to receive, in many cases, a real dependence of the chasms in the rock on the fractures which have broken it.

But there are few caverns or great fissures all whose features can be explained. The disturbance has not so often produced the caverns as the conditions necessary for their production. On the contrary, in very many cases we perceive, even in caverns now dry, forms of interstitial surface which mark the decomposing influence of air and moisture, and the erosive power of running water. Through many of them water now runs, through more of them it formerly ran, conducted into the subterranean channels by the fractured condition of the strata. The great caverns of the Peak at Castleton and Buxton may be quoted as examples. Other caverns occur, nearly or entirely exempt from the direct influence of water, and in others where the course of water is known, as at Kirkdale in Yorkshire, a cave which has for great lengths an even floor and roof, and is connected, not with faults or axes of movement, but with great joints in the limestone. These caverns are marked by the joints. Water dropping, trickling, or running through the fissured limestone rocks dissolves (by the almost constant carbonic impregnation which it derived from the atmosphere and decomposing vegetation) its calcareous channels, and transports away, to the surface of the ground, the materials of petrifying springs, the tuberculous mounds of Matlock, and the travertine of southern Europe. In certain classes of limestone there is reason to conjecture that the great caverns have not been occasioned by violent fractures, yet new by the influence of joints, but that they are a part of the original structure of a coral reef (in which cavities were left by the polynoids builders), or have been generated by those chemical processes which we have as yet imperfectly traced and classed as metamorphic effects. This may be the case in certain magnesiferous (dolomitic) limestones in Derbyshire, France, and those caverns.

In regard to the filling of these cavities, we must again, in a great majority of instances, appeal to the action of water—an inverse action, new circumstances causing water to deposit where once it was evaporated; or an antecedent action, occasioning new accidents. Stalactical depositions and many varieties of sparry accumulations, which are now happening in caverns and lakes, confirm the former case, and as an instance of the latter we may describe what is known as the great North Yorkshire coast. Here the chalk is cavernous; the caverns, connected above with small fissures reaching to a mass of diluvial earth, have been filled for the most part by the water falling from waves and spray of the sea, and sometimes their roof, thus weakened, falls in, and the diluvial masses from above pour down into the cave, but are soon removed by the agitation of the tide.

Another instance is of familiar occurrence in the mining districts of the north of England, where limestone, more or less cavernous and fissured, is covered by shales or argillaceous toesands. Near the edge of these argillaceous beds, many rather regular pits (clay hollows) occur, through which the surface drainage reaches the limestone, and carries into its cavities some of the materials which are diloged in its course.

The geologist, who takes into consideration the possible origina of caverns in limestone from original hollows, the influence of joint fissures, and the effect of violent displacements; and considers further the various degrees and circumstances under which a cavern is formed, or the various action of water within them, their level in relation to that of the sea, and the nature of the strata or other matter superincumbent on the limestone, will be at no loss to comprehend how diverse, complicated, and variable are the processes of the earthy and earthy contents of subterranean cavities. These contents have in some cases fallen, in so as to constitute confused heaps or masses of breccia; in other cases they have been drifted by the waters, or have been washed away by storms, or have been dissolved, and deposited in crystallized and stalagmitic forms.

The occurrence of bones in these caverns, sediments, and stalagmitic incrustations is sometimes to be explained by supposing them to have been washed down by streams, or to have been drifted with sediments by water; but in a considerable proportion of the cases which have been examined there is no avoiding the conclusion that animals retired by the waters, or drifted into these cavities, and have left their bones in these cavities, and there have left their bones. This conclusion, established by the magnitude of Buckland for the hyena caves of Kirkdale and Torquay, applies to the numerous bear caves of the Harz, France, and Westphalia, and to the bear caves in Brazil and Virginia. It is a conclusion of the highest importance in geology and zoology. It assures us of the habitat of many extinct races of quadrupeds, and thus furnishes authentic data for a survey of the geographical distribution of Mammalia in one definite period of great antiquity, under which and climatic conditions of the globe much different from what it now is. Thus for instance we find among the perished races of British quadrupeds, the lion, hyena, and bear; the elephant, rhinoceros, and hippopotamus; the urus and the elk.

To allow of the introduction of these animals to Britain, we must suppose this island joined to the continent; to allow of their long continued existence here (which the phenomena in Kirkdale cave substantiate), we must suppose certain climatic and physical conditions. Practically, the great caverns of Kirkdale, near Kendal, in Yorkshire, are remarkable, having a general phenomenon, extending over a great part of the northern zones of the world, and of such startling magnitude as to have suggested hypotheses of diavilic catastrophes, and glacial periods, to geologists; while zoologists may perhaps regard it as a great example of the law of limited duration and successive predomination, to which, judging from the whole course of paleontological discovery, all the races of the animal creation must submit. The reader may consult, for the facts and inferences thus briefly noticed, Cuvier, Osservazioni; Buckland, Relazioni Diluviane; Meyer, Paleontologia; Owen, On British Fossil Mammalia, in Transactions of the British Association, and a variety of Memoirs by different authors in the Transactions and Proceedings of the Geological Society of London.

Ostracion [Schickel, P. C. S.].

Otterm, Karl Theodor, an architect to whom Brunswick is indebted for what ranks almost among the largest, and certainly among the most elegant palaces in all Europe, was born in that city, January 19th, 1800. He was the son of a physician, who intended him for the same profession; but his father's death leaving him free to follow his own inclinations, he made choice of architecture as his future profession. He studied architecture at the Polytechnic Institute at Berlin, 1812; and was compelled for a time to earn his living by the production of drawings and plans and by erecting the theatre there, called the Konsigstaed Theatre, which was begun in July 1823, and opened in the August of the following year. This decided success on the part of one so young—it being in fact his coup d' essai,—brought Otterm forward: henceforward it should, however, be mentioned that, although he was not known at the time, his designs were corrected by Schinkel. [Schickel, P. C. S.]. In his next work of note, the 'Sing.-academie' at Berlin (erected 1826-7), his design obtained preference of that of Schinkel, although the latter was in every superior taste, and indeed, one of the happiest ideas of the great master, as may be seen by the published drawings of it in his "Entwürfe," &c. As all this was, it was not without its disadvantages, as by immersing him too early and too completely in matters of mere business, it hindered that calm application to study which is so important to an artist at the outset of his career, and besides being spoilt by the exaggerated praises bestowed on his first efforts,—praises which, it has been suspected, proceeded partly from a desire to lessen the reputation and keep down the price of the work. Fortunately, he found it necessary for improving himself; and after first studying a short time in Paris, he visited Italy, where he remained nearly two years (1827-9); and where he was so far inspired as to complete and give the project and design of a building which should surpass every known edifice of the kind in extent and magnificence.
He was recalled to Germany by an invitation from Dresden, where he proposed to build a new theatre; and he proposed designs accordingly; but the scheme was dropped for several years, and then Semper was the architect employed on the noble structure since erected there. The designs produced at Dresden were the first of the several he made for him while he was at Dresden, a commission from the Duke of Saxo-Meiningen to make others for a theatre and casino for him, and the buildings were forthwith commenced. On his return to Breslau in 1830, the first part of his 1st Architectonic Mittheilungen, containing plans, &c. of his Theatre at Berlin. At that time his professional occupation consisted of little more than his official duties as Hofbaumeister, nor was the actual erection of ever being of any work of importance, when during a popular tumult which took place in September, 1830, the palace at Brunswick was set fire to and destroyed. He was thereupon directed by the new Duke, Wilhelm (the successor of his brother Karl, who was expelled by the revolution), to make designs for rebuilding the palace; and the edifice was begun the following year, and prosecuted with such activity as to be ready for habitation in 1837. The principal mass is 400 feet in extent, by upwards of 200 in depth, and 80 high, and in the centre considerably loftier, though the design has not yet been fully carried out, the open colonnades intended to form a place before the principal façade not being yet erected. Still, should nothing further ever be done, this palace is a most stately and elegant pile as it is; and even now it has been objected to it that it is too extravagant and costly a sacrifice of public labour and expense; and he has been prodigiously beseeching for besides that he was obliged to supplant every department of the works personally, from first to last, he designed the numerous details both of the exterior and interior, which display considerable inventive power as well as refined taste. The principal entablature of the exterior—extending altogether two thousand feet in length—is entirely of crimson, and much equally excellent and novel construction is displayed in other parts. The interior is distinguished by many striking pieces—the lower entrance vestibule, a Grecian Doric hall 150 feet in length; the parade staircase; the upper vestibule, a rotunda seventy feet in diameter, and sixty high; gallery; theatre; concert room; banquetting room, &c.

Besides the palace, Otter erected at Brunswick several other structures, both public and private, all of them, more or less, of architectural note: viz. the Theater-Intendantur, the Infantry Barracks, in the Florentine style, with a façade of 350 feet; the Iron Bridge, the Villa Bulow, New Richmond, the Schmitzhaus, the Interim Railway-station, &c. He also made a design for Cavalry Barracks at Brunswick, in similar style to those for the infantry; which design was published in Rosenthals' 'Zeitschrift für praktische Baukunst,' 1843, which is left behind him will perhaps remain unedited. Naturally of a delicate constitution, Otterm sank under the harass of business and the multiplicity of his tasks in the prime of life, August 22nd, 1843; but he lived to the hundred of the century, hardly would he have had such another opportunity as that afforded him by the Palace of Brunswick.

OVA, or as the name imports, egg-shaped, is the name given originally to such a form as the section of an egg presents, round, but not circular. In mathematics it has received some extension of meaning. Any curve, or isolated branch of a curve, which returns into itself, would be called an oval: perhaps even a figure of eight would receive the name.

The curve having for its equation

\[ y = \sqrt{x^2 - 4x + 4} \]

(a and b being positive; and a less than b) has an oval extremity. The new curve is to the origin x = b; but there is no curve whatever from \( x = a \) to \( x = b \), or from \( x = b \) to \( x = 0 \). If a be small, the dimensions of the oval are small: and when \( a = 0 \) the equation becomes

\[ x = \sqrt{y^2 - 4y + 4} \]

in which the oval has become a point (the origin), and is a conjugate point (Curve, P. C.), an isolated point which is not on any continuous branch.

Some conjugate points have none but imaginary values of \( dy/dx \), some have one and some two, and in the case of

\[ y = x^2 - 4x + 4 \]

there is a conjugate point at the origin, and \( dy/dx \) is then imaginary; but when

\[ y = x^2 - 4x + 4 \]

there is also a conjugate point at the origin, but \( dy/dx \) is there. The meaning seems to be as far as we can judge from a few of the instances that when the oval during its diminution has axes which preserve a finite ratio to one another, so that its tangents fall in all directions, the ultimate value of \( dy/dx \) is imaginary. But when one of the axes diminishes without limit at a point and the other remains finite, the tangents of that axis, the tangents tend to assume one direction, there is an ultimate value of \( dy/dx \) which defines that direction. If our surmise be correct, a double or triple value of \( dy/dx \) at the conjugate point would indicate the existence of a star-shaped oval, or of one which tends to assume that form as it diminishes. But this, with other points relating to the singular values of algebraic functions, has yet to be fully considered.

OWEN, JOHN, DR., was born in 1616, at Stadham in Oxfordshire, of which parish his father, Henry Owen, was for some time minister. At the age of twelve he was admitted a student at Queen's College, Oxford, where he took his first degree in 1632. During the period of his university life he is represented as having so diligently applied himself to study that he never allowed himself more than four hours repose. In the year 1637, when he was an instance of illegal taxation (Hammond, P. C.), Archbishop Laud, the chancellor of the university, made some new regulations, of which Owen disapproved. He was thus obliged to continue to Oxford. Brought up by his father in the strictest school of Puritanism, he considered the new statutes an attempt to enforce the observance of superstitious rites. On leaving Oxford he accepted the invitation of William, Lord Buckhurst, Sir Richard Dormer, of Ascot in Oxfordshire, having been some time previous to his expulsion admitted into holy orders by Bishop Bancroft. He afterwards became chaplain to the Earl of Lovelace, of Holland Park, London, whom he remained till the outbreak of the civil war, when, as he warmly espoused the cause of the Parliament, he forfeited the protection of his patron. Left to his own resources, Owen retired to London, where he appears to have joined the non-conformists. In 1642 he published his first work, entitled 'A Display of Arminianism,' which soon recommended the author to the notice of the Parliament, and became a prescriptive of his political views. Shortly afterwards presented by the committee appointed to purge the Church of scandalous ministers' to the preferment of Fordham in Essex. He enjoyed this living little more than a year, having been deprived of it by the patron, to whom it had reverted on the death of the sequentor incumbent. The Earl of Warwick then bestowed upon him the living of Coggleshott in the same county. Owen had not been long at Coggleshott before he abandoned the Presbyterian party to join that of the Independents. On the 29th April, 1646, one of the frequent fast days instituted by the Puritans, he was called to preach before the Parliament, and his sermon, on that occasion, 'on the necessity of one man's judgment being more prevalent than was prevalent among his party at that period. He still more strongly manifested his tolerant disposition when he was appointed to the critical task of preaching before the same assembly after the battle of Edgehill, which was not long before.

In this sermon he solemnly warns his hearers against oppression, self-seeking, and persecution. On the 26th February following, a day set apart for humiliation and prayer on account of the intended expedition to Ireland, he was again appointed to preach before Parliament and the chief officers of the army; on that occasion, Cromwell, who heard him for the first time, pronounced so favourably of his exposition of his merit, that he named him his chaplain, in which capacity he accompanied the expedition. In 1651 Owen was, by an order of the Parliament, promoted to the dignity of dean of Christ Church, and the following year made vice-chancellor of the University of Oxford, Cromwell being at that time chancellor. He appears to have discharged the peculiarly difficult duties of this office with much moderation, and his conduct met with the approbation of many of the Episcopalian party. After holding it five years, on the death of Cromwell he was deprived of it, as well as of his deanship, to which Dr. Reynolds, a Presbyterian, was appointed.

At the time Owen retired to small estates, which he had purchased in his native place, where he employed himself in preaching as often as an opportunity was afforded him. He was, however, soon obliged to abandon an occupation to which he had accustomed himself, particularly to the administration of the militia, and he determined upon settling in London. It was there that he published a work entitled 'Flat Lux,' in answer to the writings of a Franciscan friar, which attracted the
attention of Lord Clarendon. This statesman, who was anxious to reconcile the most moderate of the non-conformist party (H. R. P. C.), offered Owen immediate preferment if he would conform; which proposal, however, was firmly, though respectfully, declined. He then formed a congregation, among which he assiduously laboured, and in conjunction with Baxter, Bates, and other leading men of his persuasion, insisted upon the necessity of the restoration of the church of England. De Carbon contracted a second marriage, by which he was enabled to live in comparative affluence on an estate at Ealing, in Middlesex, where he died on the 24th of August, 1683.

The species described by De Carbon has equally been admired by those who were united with him by similarity of religious feeling, and by those who differed most widely from him in opinion; and it is not surprising to the temperance of his language and the mildness of his disposition. This character is a great measure reflected in its works, which, though strongly tinted by the peculiarities of the Calvinistic system, are not capable of their devotional spirit and are calculated to encourage practical piety. He certainly belonged to that section of his party whom Lord Clarendon designates as 'the more learned and rational.' (Clarendon 'History of the Rebellion,' vol. v. p. 513; see Warburton's note.) His works are very numerous among the best known of those not already alluded to may be mentioned: 1. his 'Exposition of the Epistle to the Hebrews;' 2. 'A Discourse on the Bible;' 3. 'A Discourse on the Book of Job;' 4. 'An Answer to T. Beddow,' 1655; 5. 'An Examen de l'Innommé, a Dieu Nécessaire, d'Orta, Progressus et Studio Sere Theologi,' 1661; 5. 'An Examen of the Psalms,' 1660; 6. 'On the Doctrine of Justification,' 1668; 7. 'A Discourse on the Book of Job,' 1668; 8. A large collection of Sermons and Tracts. His last production was 'Meditations and Discourses on the Glory of Christ,' which it is stated was sent to the press the day he died.

(For further particulars of his life and writings the following works may be consulted: 'Biographia Britannica,' vol. v., London, 1709; 'Memoirs of the Life of Dr. Owen,' prepared by a collection of the most eminent Dr. Owen, 1721; and Wood's 'History and Antiquities of Oxford.')

OWNERSHIP. (PROPRIETY, P. C.)

OXYRA (from ἀκρός, sharp, acid; the leaves have an acid taste), a genus of plants belonging to the natural order Polygemon. It has a 4-parted perianth, the 9 interior segments larger; 6 stamens; 2 stigmas; a 1-seeded nut, compressed, with a membranous wing, larger than the persistent segments of the calyx. O. reniforme, Mountain-Sorrel, is the only species. It is found on the highest mountains of Great Britain, and is an inhabitant of Europe. It is the O. dysphania of many botanists.

OZONE (from the Greek ὀξυς, to smell) is the name given by Professor Schönbein of Basel to an odour evolved during the progress of certain spiro-cyclic decompositions. It is also produced by common electric sparks, and by the working of an ordinary electrical machine in the air. This odour attracted no particular notice until M. Schönbein called the attention of the British Association to it in 1840, since which time it has undergone much examination, and various theories have been propounded as to its nature and composition.

Ozone is evolved at the anode, or positive pole of a galvanic battery, at the same time with oxygen, during the electrolytization of any of the following bodies, viz. water, dilute sulphuric acid, solutions of phosphoric and nitric acids, potas, and many oxides. Of these substances, sulphuric acid yields it in the greatest quantity. It may also be obtained from atmospheric air, oxygen, nitrogen, hydrogen, carbonic acid, and nitrous acid, by passing the electrodes through the latter after the electrification is continued and frequently making and breaking contact. Under the influence of heat ozone disappears, and it cannot be obtained from heated solutions, or solutions of hydricants, chlorides, and carbonates of metals. The gradual evaporation of these quantities, prevents its evolution from solutions otherwise yielding it abundantly. It may be developed by electri-lyzing a solution of muriate of soda with platinum electrodes, by placing the gas collected at the anode over ammonia and water to absorb the chlorine. Ozone can be preserved for a length of time with the oxygen collected with it in well closed bottles. It possesses the property of bleaching limewater and paper coloured with indigo or a solution of that substance. It is readily absorbed by mercury and the oxidizable metals, forming oxides with them; and when the solutions employed are heated, its affinity for metals is so greatly increased that it combines with platinum and gold. Water absorbs it. The inspiration of ozone is very injurious, and the effects similar to those resulting from chlorine and bromine. It killed several persons in Athens, Greece, as well as of Japan, Mexico, North America, and Europe. The flowers are yellow; those of the North American plant are larger than the European. The gases above are formed only when the unbehindful peduncles rather shorter than the leaves. It is native of North America, and is naturalized in Cornwall and Devonshire in England. The flowers are yellow and about the size of those of O. coromandelica. This plant is native of Java, and he recommends it as a pleasant cooler and diuretic; formerly P. C. S., No. 135.
are obtained: with platinum electrodes the odour is very powerful; but it is not produced when copper, zinc, or iron electrodes are employed. With boxwood charcoal the gas given off from the positive pole has no smell; but when absorbed by lime-water it turns it milky, proving the gas to be carbonic acid. With gas charcoal, sulphuretted hydrogen is evolved at the negative pole and carbonic acid at the positive; but no odour of ozone is produced. With a solution of mutarasa of soda the odour is not perceptible until the gas obtained from platinum electrodes at the positive pole is placed over ammonia and then over the charcoal. The residual gas emits the peculiar odour.

There exists much variance in the experimental results with this new substance; and not less in the opinions concerning its nature. Professor Schönbein considers it to be a trioxide or peroxyde of hydrogen. Marignac controversy M. Schönbein's conclusion, that it is to be derived from the decomposition of nitrogen, as he obtained it from water free from this latter gas. Mr. Williamson would prove that it is a compound, and that hydrogen is one of its elements, he having obtained it from a salt of copper, and passing the oxygen with the ozone over metallic copper which had been reduced by carbonic oxide gas, a sensible formation of water resulted. His view of the subject is, that ozone is a higher oxide of hydrogen than water, although not the peroxide of hydrogen of T histard, which is not volatile like ozone, but inodorous and fixed. Mr. Gann remarks, I intend to think that this peculiar odour may be emitted from all metallic bodies in such a manner as to prevent oxidation or combination with other bodies; and that all metals have the power of emitting it, when put into a peculiar electrical state, that is, when the metals are in a state of transition previous to oxidation or combination; and Mr. Lake, who claims to have demonstrated that the electric fluid is a substance, to which he has given the name of pyrogen [P yroge, P. C. S.], considers that it is a compound of this substance with oxygen, that is, an oxide of pyrogen. He says, 'It would seem indeed the necessary inference of Mr. Gann's experiments (the evolution of ozone from oxygen and the other gases) that oxygen enters into the composition of nitrogen and hydrogen, for ozone is developed, except in these two instances, from oxygen and its compounds, by the combination of oxygen with pyrogen, and hence it would follow that nitrogen and hydrogen contain oxygen.'

The inquiry concerning the substance is of great importance to chemical science, as it involves the question of the nature of oxygen, hydrogen, and nitrogen, from each of which it can be obtained. It is agreed by all that oxygen is one of the elements of ozone. If, therefore, hydrogen is the other, it follows that oxygen is a compound into the composition of which hydrogen enters; that oxygen is an element of hydrogen; and that both oxygen and hydrogen are elements of nitrogen, since ozone can be evolved from each of these gases: and it is to be remarked that this last circumstance agrees with Mr. G. J. Knox's discovery, that nitrogen is a compound of hydrogen and silicon. This also overthrows M. Marignac's opinion, that it cannot be obtained by the decomposition of nitrogen, and confirms M. Schönbein's to the contrary effect.

Mr. Gann's opinion, in substance and as far as it goes, coincides with Mr. Lake's, for he considers ozone to accrue between the oxidation or combination of the metals with the substances exhibited to them and the time when chemical action commences. According to the latter, ozone must be present and of paramount importance in the processes of acidification and oxidation, for he shows that both oxygen and the electric fluid (which he considers the elements of ozone to be) are required to form an acid [Pyrogen, P. C. S.], and of course no oxide. If this view be correct it accounts for the disappearance of ozone where the more oxidizable metals are exhibited to it, and also for the formation of carbonic acid when acid solutions are electrified with carbon as the positive electrode.

Some singular phenomena connected with ozone were observed by Professor Schönbein, strongly indicative of its electric origin, if not of its electric composition. When perfectly clean and dry plates of gold or platinum are immersed in oxygen containing ozone, they acquire a negatively electric state of polarity. Silver and copper also become thus electric, but in a far less degree than zinc; and these plates thus polarized retain their electric powers in air for a considerable time, but rapidly lose them when plunged into hydrogen gas, in which, if retained a sufficient time, they acquire an opposite state, becoming positively polarized.

When a perfectly clean and dry plate of gold or platinum is exposed to an electric brush it becomes positively polarized, the degree of polarity depending upon the nature of the point and the time the plate is exposed to the brush issuing from it. This power may be attributed, according to the last of the above theories, to the formation of ozone by the combination of the electric fluid of the brush with the oxygen of the air. If the point from which the electric brush is issuing be moistened with water, the electricity still continues to be given off, but the power of polarizing the plates is lost, which effect is no doubt produced by the water absorbing the oxygen. Heat, which destroys, or exposure to hydrogen, which inverts, the electricity of a plate that has been polarized by exposure to oxygen containing ozone, exerts a precisely similar action on plates polarized by the electric brush.

(Proceedings of London Electrical Society, 1841-42, p. 160; Reports of the British Association, 1840; Polytechnic Review, New Series, vol. ii. p. 260; Athenaeum, 1845, pp. 690, 674, 723; Chemical Gazette, September, 1843.)

* According to Professor Schönbein, nitrogen is a combination analogous to hydrochloric acid, and is composed of ozone and hydrogen.

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PACCIARIOTTO, JA'COPO, one of the most distinguished of the old Siennese painters, was born at Siena in the latter part of the fifteenth century; but though he has a chronology to the painters of the sixteenth century, he is one of the quattrocentisti in style; his works much resemble those of Pietro Perugino; at the same time they are more fully developed in form and of wonderful force of colour. His chief works, celebrated masterpieces, are:

He lived in Siena until the year 1535, when, owing to his being one of the principals in a conspiracy of the people against the government, he was compelled to fly, and he took refuge in France. Lanzi says that he would certainly have been hanged, had he not been protected by the Osservanti monks who concealed him for some time in a tomb. He succeeded in making his escape, and joined II Rosso in France, where he in all probability ended his days not very long afterwards, as nothing further is known of him, and he does not appear to have left any works in France.

There are still several excellent paintings, both in oil and in fresco, by Pacchiarotto, in Siena. There is a beautiful altar-piece in San Cristoforo; and some excellent frescoes in Santa Caterina and San Bernardino. Speth takes particular notice of these frescoes in his "Art in Italy," and terms Pacchiarotto the second hero of the Siene school—Lanzi, calling Sodoma, being the first. They are highly praised also by Lanzi. In Santa Caterina is the visit of St. Catherine of Siena to the body of St. Agnes of Montepulciano, in which are a host and figures worthy of Raphael. According to Speth these works can be justly compared with Raphael's alone, and he adds that designating Pacchiarotto as the head of the school of Perugino, is only magnifying the injustice he had already undergone in being reduced to the long report as the works of Perugino. If therefore he were the pupil of Perugino, what Perugino supplied was only the spark, says Speth, which in Pacchiarotto grew into a flame.

Pacchiarotto has suffered the same misfortune that many other excellent masters have undergone, owing to their being omitted by Vasari—their merits have remained long unrecognized. Pacchiarotto is probably the Girolamo di Pac his cousin was casually mentioned by Vasari in speaking of II Sodoma; they painted together in San Bernardino.

There are two beautiful small easel pictures in oil and on wood in the Pinciotheek at Munich by Pacchiarotto—San Francisco d'Assisi, with two angels in the background; and the Madonna and Child, with four angels in the background; half-length figures in both. They are two of the best pictures in the collection, in character, colour, and execution, and are among the best specimens of the beauties of the early Italian schools of painting. They were formerly in the church of San Bernardino at Siena, but were purchased and presented by the present King of Bavaria, Ludwig I., then crown-prince.

(Lanzi, Storia Pittorica, &c.; Speth, Kunst in Italien, vol. ii.)

PACHECO, FRANCISCO, was born of a good family at Seville, in 1571, according to his own account, which is nine years earlier than the date given by Palomino. He was nephew of Francisco Pacheco, canon of the cathedral of Seville, a distinguished divine and a celebrated Latin poet.

Pacheco's master was Luis Fernandez, a painter of severs &c. at Seville: he never was in Italy, as Palomino has wrongly inferred from two passages in his treatise on painting; he studied exclusively in Seville. His first works worthy of notice were two large flags or standards for the Spanish fleet of New Spain and Tierra Firme, painted in 1594, in oil on crimson damask, each thirty yards by fifty; the paintings were sewed on to the flags, and hung on the rich borders and other decorations. He was one of the principal painters employed on the great decorations of the funeral or catafalque of Philip II. of Spain in the cathedral of Seville in 1599. He was also the first, says Cona Bermudes, in Seville who properly painted and gilded statues—el primero en encarnar y estabar bien las estatuas; thin colour was painted over the gold. He was the first likewise who painted the figures of the Virgin and Child, which are several works of both descriptions by Pacheco in Seville.

In 1600 he was appointed, together with Alonso Vazquez, to paint a series of large pictures illustrating the life of St. Ramon for the cloister of the convent of the Merced. In 1603 he executed some works in damper in the palace of Don Fernando de Ribera, third duke of Alcalá, from the story of Dádulus and Icarus.

It was not till 1611 that he visited Toledo, Madrid and the Escorial, and saw the great works of Titian and other celebrated masters, and more closely studied the excellent works which he saw on this occasion impressed him forcibly with the varied and incessant application requisite to form a great painter. Accordingly upon his return to Seville he opened a systematic academy of the arts, as well for his own improvement as for the benefit of the rising artists of Seville; and the fact alone that Alonso Cano and Velasquez were two of his scholars, shows that his system worked with some effect. The improvement he himself acquired by such elementary instruction, and from the true principles of art, is shown by his great picture of the Last Judgment, an altar-piece finished in 1614 for the nuns of the convent of St. Isabel, which he has himself described at great length in his treatise on painting. Soulé made a magazine of this convent during his occupation of Andalucia, and the picture was probably removed. It was a large work containing many figures and many incidents, but Pacheco received only 700 ducats for it. On one part of it was inscribed 'Futurum ad Finem Saculorum Judicium Franciscus Paccies Romulense depingebat. Saeulos a judicis natali xxv. anno xi.'

In 1618 Pacheco was appointed by the Inquisition one of the guardians of the public morals, in as far as he was made censor of all the pictures which were exposed for sale in Seville; nakedness was prohibited, and it was Pacheco's business to see that no picture was sold which showed a naked female of the size of life, if of any other size. It reflects the jealous morosity of the Inquisition even in its portraits. Frudery was carried so far in Spain, that in the time of Ferdinand VII. even all the great Italian works which could be reproached with nudities were removed from the galleries, and were condemned to a distinct set of apartments called the Galeria Reservada, and only opened to view to those who could procure special orders. There is a 'Cabinet des Objets Réservés' at Naples, and though this is separated from the rest of the collection with reason, there is no difficulty whatever in obtaining admission into it; but the Galeria Reservada of Madrid is of a very different nature, and comparatively innocent, and the separation of such works from the general collection is a greater evidence of subjective immorality than objective immorality. Mr. Ford, in his 'History of Spanish Art,' terms this gallery a sort of Magdalen, or penitentiary, into which were banished all peccant pictures whose nudities might corrupt the purity of Madrid; where the Italian and Flemish Ledas, Danasés, and other improper ladies, blushed unseen, lumped together like the naughty epigrams of Martial when collected into one appendix in well-intentioned editions. All these pictures were the works of foreigners. 'Nothing,' says Mr. Ford, p. 116, 'gave the holy tribunal greater uneasiness than how Adam and Eve in Paradise, the blessed souls burning in purgatory, the lady who tempted St. Anthony, or the Last Day of Judgment, were to be painted, circumstances in which small-clothes and long-clothes would be highly misplaced. Both Palomino (ii. 187) and Pacheco (201) handle these delicate subjects very tenderly. Describing the celebrated Last Judgment of Martin de Vos, he remarks: 'It formed him that he had chanced, when only a simple monk, to perform service before this group of nakedness; the mitre had not obliterates the dire recollections; he observed (he had been a sailor) that on the day of judgment, when the last man mass before it again, he would face a hurricane in the Gulf of Bermuda; the moral effect of the awful Day of Judgment was so much counter-balanced by the immoral desolation.'

In 1623 Pacheco again visited Italy, and was visited by his distinguished scholar and son-in-law Velasquez, and he remained two years in the Spanish capital. Velasquez went
to Madrid by the invitation of the duke de Olivarres, who procured him the appointment of painter to the king, Philip IV. It was at this time that Velazquez painted his equestrian portrait of Philip, upon which Pacheco wrote a sonnet, in which he was compared with Alexander, and Velazquez with Apelles (Cena de Madrid, v. 1619).

Pacheco, during this visit to Madrid, among many other works, executed one which hardly accords with the present notions of the occupation of a great painter, though it has been the practice of great artists from very early ages to treat in their statues: it was common in the time of Plato and of Alexander. [Niclas, P. C. S.] Pacheco dressed, gilded, and painted (except for the duchess of Olivares, a statue mostly of wood, of the Virgin, by Juan Gomez de Mora, for 2000 reals. The work was much admired, and by none more than Eugenio Cazes, who, says Cean Bermudes, estimated the decoration at 500 ducats. What this process exactly was is not evident from this mere mention; but the object generally in these painted wooden images appears to have been to obtain an exact imitation in the minutest detail, perpetual femaleness. The effect of such images, called Pasos, must be experienced to be comprehended. The Spaniards dress them as well as paint them. Their churches were crowded with such works; but most have now been removed to private possession.

Pacheco returned to Seville, where his house became a chief resort of all men of art, of literature, and of taste, and among his most intimate associates were the Jesuits of Seville, who instilled into him a love for art, and who were indeed the authors of that part which is devoted to sacred art; and doubtless to them is due the austere morality which characterises Pacheco's principles of art. He is noticed above as having been a great lover of painted images. He published an essay partly on this subject in 1622, complaining of sculptors painting their own statues. But the generality of Donoradores and Estafadores worked so badly, that such sculptors as Juan Martin Montanes and Alonso Cano felt compelled to dress and colour their own statues. Pacheco however coloured many statues for Montesinos, including the St. Jerome of the monastery of Santiponce. Montesinos generally went with his employer to be allowed to superintend the toilet of his own statues. Mr. Ford gives some curious details about the toilets of these Spanish images. No man is allowed in Spain to undress the Pasos, or Sagrados Imagenes of the Virgin; and some images had their merrinesse of the robes (Camarena Mayor) and a chamber (Camara) where their toilet was made. The duty has, however, now devolved upon old maids; and ha quedado para vestir imagines—she who has gone to dress images, has become a term of reproach. Embroidering rich dresses for images of the Virgin is still a great occupation with the rich and pious ladies of Spain. Similar customs prevailed with the antients. But the great pride of Mr. Ford, paid much more attention to decorum and propriety of costume than the Spanish clergy. In the remote villages and in the mendicant convents the most ridiculous macaquedroles were exhibited, such as the Spaniards were wont to wear in their Ursulines, with wig, and cap, figures have only heads, feet, and arms, the bodies being mere blocks, because destined to be covered with drapery; they are called 'imagines a vestir.' Before the French occupation of Spain there were fifty of these images in Seville alone, which were carried in various processions in the holy week, and on other great occasions.

Pacheco died at Seville in 1654. His works, though not vigorous, are correct in form, effective in light and shade, studied in composition, and simple in attitude; but they have little colour, are dry, and rather feeble or timid in their handling. These defects are more apparent when his pictures are seen together with the works of other Andalucian painters, who have generally made colouring their principal study, and have comparatively neglected purity of form. Besides many religious pictures, he painted or drew in crayons nearly four hundred portraits, the best of which is that of his own mistress. One of his sitters also was Miguel Cervantes.

His Arte de Pintura, su Antiguedad, y Grandezas, 4to, Seville, 1649, pp. 641, a remarkably scarce book, is considered an indispensable study by the painters of Seville, and it is as far as is possible the perfect method of Seville. It is very elementary, and is said also to be a work of great learning on the subject, and is held throughout Spain to be the best work on painting in the Spanish language: it is in three parts, in modern Spanish verse, and does not contain any technical knowledge. His works are seldom seen out of Seville; and he is even very inadequately represented in the splendid gallery of the Prado at Madrid.

His masterpiece is, or perhaps rather was, the altarpiece of the Archangel Michael expelling Satan from Paradise, which was in the church of San Alberto at Seville; but this church was one of Souli's museums. There are still at Seville an altarpiece of the Conception at San Lorenzo, two pictures of San Fernando in San Clemente; and a picture in San Albano. The methodical system of Cean Bermudes to mention the locale of all the most celebrated works of the great Spanish masters, eventually cost Spain a greater portion of these works, for his dictionary was compiled by Cean Bermudes as an inventory of what was valuable, and directed them to the places where these works were to be found. Not a moiety of the works of Pacheco are mentioned by Bermudes as at Seville is now to be found there. Pacheco's own portrait by himself is in the Spanish museum in the Louvre.

Pacheco collected the poems of his friend Bernardo de Herrera, and published them with a portrait, in 1619. His own poems do not appear ever to have been published in a collected form. Bermudes has printed a few in his Dictionary. (Cean Bermudes, Dicionario Historico de los mas Ilustres Profesores de las Belleas Artes en Espana.)

PACHYCIORMUS, a genus of Ganoid fossil fishes, from the lias of England and Wurttemberg. (Agassiz.)

PACHYCEPHALUS, a genus of fossil fishes from Shropshire. (Trew.)

PACHYDODON, a genus of Dimyarian Conichthys, fossil in the lias and oolites. (Strickland.) This is the genus Cardinia of Agassiz, and includes part of the Unionide of Swainson.

PACHYPTERIS, a genus of fossil Ferns, from the oolite of Yorkshire. (Brongniart.)

PACKING-PRESS. The hydraulic press invented by Mr. Brunner, besides being used to draw piles, trees, and blocks from the ground, or to prove the strength of materials, is frequently employed to pack or compress bales of linen, cotton, and the like goods into small dimensions for the convenience of transport. The description of this machine has been given under HYDRAULICS, P. C.; and it is intended here merely to notice the method employed by Mr. Barlow to determine the thickness which the cylinder should have in order that its strength may be equal to the strain to which it is subject from the pressure of the fluid within it.

Within any horizontal section of the cylinder the tendency of the contiguous particles of metal to separate from one another in a direction perpendicular to a diameter passing through them, in consequence of the expansion produced by the pressure of the fluid, becomes continually less from the interior to the exterior circumference of the section, and is inversely proportional to the distances of the particles from the axis of the cylinder; and the cohesive power of the particles is, by the laws of elasticity, proportional to their separation, while the strain produced by the pressure of the fluid varies as the square of the distance from the axis of that part from the axis. It follows that the resistance opposed at such part of a section to the momentum of the pressure is inversely proportional to the square of the distance from the axis of that part.

Therefore r representing the radius of the interior surface of the cylinder, t the whole thickness, and x any variable distance from the interior surface towards the external, all in inches; then \( \int_{r}^{t} \frac{x}{(r^2-x^2)} \, dx \), if multiplied by \( \pi \), the circumference (rad. = 1), and by the force of cohesion on a square inch of the metal, will express the resistance produced by an annulus which is one inch deep in a direction parallel to the axis.

That integral, for the whole thickness \( t \), is \( \frac{\pi}{4} t^2 \); therefore

\[ \int (\text{in pounds}) \text{ denoting the force of cohesion,} \quad \frac{2 \pi tf}{r^2-t^2} \]

expresses the whole resistance.

\[ \int (\text{in pounds}) \text{ represent the force on a square inch of the interior surface, by which the pressure of the fluid tends to strain the cylinder,} \quad \frac{2 \pi tf}{r^2-t^2} \]

will denote the whole strain on the same annulus; therefore, equating the strength and strain, there is obtained

\[ t^2 = \frac{\pi}{2} \frac{2 \pi tf}{r^2-t^2} \]

This value of \( t \) expresses the required thickness.

PACO. [LLAMA, P. C.]
PADDLES, PADDLE-WHEELS. [Steam-Vessels, P. 463, pp. 480, 486, 608.]

Familj Paddles contain plants belonging to the natural order Cincinaceae. It has a small 5-toothed permanent calyx, a funnel-shaped corolla, hairy inside, 5-lobed, and with a pilated stamnation. There are 5 stamens, some times 2 or 3 shorter, nearly sessile in the middle of the tube. The style is not prostrated, and the stigma bident. The berry is small, roundish, and globose, tr-angled, with a seed in each cell. The flowers are white, small, and usually unclosed.

**P. ficoides** has a woody twining stem, round and smooth. The leaves are oblong or lanceolate, cordate at the base and glabrous. The panicles axillary, terminal, opposite, short, and the flowers are usually small and pink, the bracts ovate, the calyx 6-toothed, the corolla with a long tube somewhat gibbous and woolly inside; the limb narrow and divided into 5-cordate ciliate segments. The berry is dry, compressed, being 5 lines on each side, 1-seeded, and 2-seeded. The seeds are smooth, compressed, enlarged with a somewhat membranous ring all round. The leaves have a very fleshy and allaceous odor when bruised, yet they are used to impregnate baths and are administered in a decoction medicinally in cases of retention of urine and some febrile complaints. According to Roxburgh the root is used by the Hindoos. it is a native of the East Indies, and of Japan and the Moluccas.

**P. ternata** has an erect smooth trichotomous stem with triangular branches; leaves 3 in a whort; oblong lanceolate, the blades being divided into the calyx campanulate and obscurely 6-toothed. It is a native of the East Indies on the mountains which border on Silhet. The flowers are rather large, funnel-shaped, white, on long filiform pedicels, each pedicel having a pair of linear ciliate bracts above the middle. The flowers are said to be fragrant when fresh, but emit a very offensive smell on being steeped in water after they have been dried.

The species of Paederia are free growers and will strike root in any kind of light rich soil under a hand-glass. (Don, Gardener's Dictionary; Lindley, Flora Medica.)

**PAGANI, GREGORIO.** was born at Florence in 1500; his father, Francesco Pagni, died aged only thirty, when his son was but three years old. Gregorio was an excellent colourist, who first the pupil of Santi Titi, and afterwards of Cigoli, and became one of the first and most able re-formers of the Florentine school from the low state to which it had been reduced by the blind followers of the anatomical school of Michael Angelo. (Tuscan School of Painting, F. C.)

Bargelli had a school of his own, but Cigoli was its principal representative, and Pagni adhered so closely to the style of his friend and master Cigoli, that he used to be termed the second Cigoli. His masterpiece, however, was the painting of the Virgin in the Cappella di Firenze, was burnt in the fire which destroyed that building in 1771, and Pagni's reputation has greatly suffered in consequence, though there is a print of it by G. B. Cecchi and B. Angelini. It was once the centre of a fresco in Santa Maria Novella: its easel-pictures in oil are also rare. He died at Florence in 1605: Matteo Rossini was his scholar.

**PAGANTINI, NICOLÒ**, whose European fame as a violinist, whether justly acquired or not, entitles him to notice among distinguished characters, was born at Genoa, in 1784. His father, a commission-broker, played on the mandoline, but fully aware of the inferiority of an instrument so limited in power, he put a violin into his son's hands, and initiated him in the practice of his art. He was conducting a band and so well under parental tuition, that at eight years of age he played three times a week in the church, as well as in the public salons. At the same period he composed a sonata. In his ninth year, he played before the Society of Oratorio of Genoa; then had lessons of Rolla, a famous performer and composer; and finally studied counterpoint at Parma under C. Doni and A. Guglietti, and the celebrated maestro Farinelli. He now took the Emperor Josephine to Bavaria, and went with her to Russia, where he was presented to the Empress, and himself invited to the full extent of her means, superior talent of every kind. In 1813 he performed at Milan; five years later at Venice, and subsequently at Florence and Naples. In 1828 he returned to Vienna, where a very popular violinist and composer, Mayeck, asked him how he produced such new effects. His reply was characteristic of a selfish musician:—"Chaucer's advice," said he. "In that capital he was accused of having murdered his wife with his own sword, and of having married, which could not be produced. Then he was charged with having polygarned his mistress. This is the public explanation. The fact is, however, how to make money from friends wherever his thirst of gold led him. Avarice was his master-passion, and, second to this, gross sensuality in his intercourse with the female sex.

The year 1831 Paganinni in the usual style of a virtuoso capital he produced a sensation hardly inferior to that created by the visit of a truly great musician, Rossini. Even this renowned composer was carried away by the current of popular opinion. Being asked how he liked the new violinist, he replied, 'I have wept but three times in my life: first, on the failure of my earliest opera; the second time, when in a boat with some friends, a turkey stuffed with truffles (undine doletrues) provided for our dinners tumbled into the water; and, thirdly, on hearing Pagnianni for the first time.'

The public of Brussels, however, were moved in a very different manner. According to M. Félix, Paganini's performance at a concert by him in Brussels, was the despair of the whole of the town. He arrived in England in 1831, and immediately announced a concert at the Italian Opera-House, at a price which, if accorded to, would have enabled him to be the first of the Continent, of the gullibility of the British public, of the wealth of the aristocratic classes, and of their lavish expenditure on foreign performers; but the attempt was too cautious, even for those, and he was compelled to abate his demands. Though he succeeded in drawing audiences fifteen nights in that season at the ordinary high prices of the King's Theatre. He also gave concerts in other parts of London, and performed at walks which were taken at the end of the proceeds, and frequently the whole. He visited most of our great towns, where his good fortune still attended him. He was asked to play at the Commemoration Festival at Oxford, in 1854, and demanded 1000 guineas for his assistance at three concerts. Need we add that his terms were scornfully rejected?

Paganini died at Nice in 1840, of a diseased larynx (ataphis laryngis). By his will, dated 1837, he gave two of his sisters legacies of 60,000 and 70,000 francs; his mother a pension of 1200; the mother of his son Achillino (a Jewess of Milan) a similar pension; and the rest of his fortune, amounting to four millions, devoted to the establishment of schools and other objects before related, we give on the authority of the Biographie Universelle.

Paganini certainly was a man of genius and a great performer. His bowing was always pronounced by the masters of the violin and of music to be one of the most remarkable ever heard. His fingers were so sensitive that he could play with his middle finger as if it were the violin almost marvellous, though he made an ignoble use of his power by employing it to captivate the mob of pretentious amateurs by feats little better than sleight-of-hand. His performances in London and Paris, his playing of some of Beethoven's and other compositions, were very extraordinary; but why, as was asked at the time, be confined to one string when there are four at command that would answer every musical purpose so much better? His tone was pure though not strong, his strings having been of smaller diameter than usual, to enable him to restrain them at pleasure; for he tuned his instrument most capriciously. He could be a very expressive player: we have heard him produce effects deeply pathetic. His algæ gies evinced his knowledge of harmony, and some few of his compositions exhibit many original traits. But money was his object, and he attained it. Were the French, continuing their not uncommon practice, to put the principal incidents of Paganini's life into a dramatic form, "All for gain, or fair fame well lost," would make an appropriate title to the piece.

**Biographie Universelle**

**PAGGI, GIOVANNI BATTISTA.** was born in an ancient and noble family at Genoa, in 1564. He was the pupil of Luca Cambiaso, and was distinguished chiefly as a painter, but he was also a very dexterous designer and etcher. In 1585 he was ordered to fly from Genoa in consequence of an unfortunate homicide which the absurd conduct of a friend brought upon him. Paggi went to France, and, under the protection of the great-duke of Mantua and Ferdinand, lived in ease and reputation, until he was recalled through Archbishop Sisnudo, afterwards
cardinal, to Genoa about 1500, where he executed several excellent works, and gave a great impulse, especially in colouring, to the Genoese school of painting, of which he was the best master in his time. His masterpieces are considered two pictures in San Bartolomee, and the Slaughter of the Innocents belonging to the family of the Si- gismondo, painted in 1506. Paggi died in 1527. In 1607 he published a short treatise on the theory of painting, entitled 'Definitione, o sia Discezione della Pittura.' He wrote it in consequence of his objecting to those who, without being an artist and in his 'Trattato della Pittura,' 'Idea del Tempio della Pittura.' Paggi's treatise is extremely scarce.

(Soprani, Vite de' Pittori, &c. Genovesi; Lanzi, Storia Pittura, &c.)

PAJOU, AUGUSTIN, a distinguished French sculptor, was born at Paris in 1730, and was the pupil of J. B. Le- moune, likewise a sculptor of eminence. Pajou obtained the grand prize for sculpture in the French Academy, in 1748, and accordingly went as a pensioner of the French govern- ment to Rome, where he remained twelve years. Gabet mentions that Pajou was the sculptor of about two hundred works, in bronze, marble, stone, wood, and even in paper or pasteboard; and he gives a list of some of those which he ex- hibited. In 1768 he exhibited a sketch of the tomb of Sta- ino, at Rome, in marble and plaster, and in 1752 the statue of Louis XVI., and in 1758 the statue of Louis XV., a statue in lead, of the natural size, for the Duchesse de Ma- zarin, representing Love as ruler of the elements; and four large colossal figures in stone for the garden of the Palais- Royal in Paris, Mars, Cupid, Mars, and Apollo. The following are some of his principal works:—Pluto hold- ing Cerberus, claimed (for this work he was elected a member of the Academy); Psyche abandoned (in the Luxembourg); statues of the Dauphin, of Pomone, of Doublet, and of the sculptures of the façade of the Palais-Royal, ordered by Louis XVI. He executed also the sculptures of the Salle de l'Opéra at Versailles; the ornaments of the Palais Bourbon; and the阳性 of Orleans; and also the Noailles of the south and west faces of the Fontaine des Innocents. He died at Paris in 1809. He was made one of the professors of the French Academy of Arts in 1767; and was subsequently a member of the Royal Institute. His works were natural and manly, and was so far the exponent of his own character. His son Jacques Augustin Pajou was a painter of great merit.

(Gabet, Dictionnaire des Artistes de l'Ecole Française, &c.)

PALEOGRAPHY (from παλαιός, 'old,' and γραφή, 'writing') is a term applied to express the knowledge of the ancient styles of writing, or the study of the characters and illuminations of ancient manuscripts. Paleography is a com- paratively recent study respecting its ornaments, but it has very lately been the subject of much laborious application in all respects; and the age of a MS. may be now approximated from a few characters, though it cannot be strictly ascertained. The present article is directed particu- larly to the ornament and general illumination of ancient MSS., and their connection with the progress of painting, and is not to be confounded with the study of MSS. or the history of MSS., which is treated of in the 'Penny Cyclopædia.' The whole subject is perfectly illustrated, generally, in the splendid work recently published in Paris by Champollion Figeac, and Aimé Champollion, Fils, which contains fac-similes from most of the principal MSS. extant in Europe, admirably executed by Silvestre (Paléographie Universelle, Collection de Fac-Similes d'Écritures de tous les Peuples et de tous les Temps, par M. Silvestre, 1839-42, 4 voles, folio).

The first work which treats of this subject with regard to ornament is Diddin's 'Bibliographical Decamerion,' published in 1617, which was followed by the more comprehensive work of D'Agincourt in 1823, Histoire de l'Art par les Monuments, but which treats chiefly of Greek and Italian MSS., and the illustrations are uncourled. D'Agincourt was the first to pronounce the treasures of the Vatican Library in this depart- ment of art. A very beautiful work in colours, by Mr. Shaw, on this subject was published in London, in 1833, Illuminated Ornaments selected from MSS. and early Printed Books, from the Sixt to the Seventeenth Century, drawn and engraved by Mr. Shaw, with descriptive catalogue and an introductory essay by Sir F. Madden, keeper of the MS. in the British Museum. There are many papers on this subject in the Academy; and a series of articles on the Progress of the Art of Illumination in the Penny Magazine of 1839.

The illumination of MSS. was in practice among the ancient Romans. This is known from passages in ancient writers, though there are no MSS. extant of an earlier date than about the third century of the Christian era. Portraits were sometimes prefixed to the writings of authors: Martial (xiv. 186) men- tions one of Virgil which was prefixed to a MS. of his works; and Virgil himself mentions a MS. of his own works, and portraits of 700 distinguished men in his writings, and dis- persed them over all parts of the world.

The illumination of MSS. is generally considered as a corollary to the art of manuscript painting, though, at the revival of painting MSS. were illuminated by painters, the calligraphists must have always been a distinct class, and even the initial letters and borders were executed by distinct personages. The artist who wrote the text often worked from the fact that some MSS. want the initial letters altogether, the spaces being left to be filled in by the proper artist. Though many illuminators of MSS., or miniaturists, at about the time of the revival of painting became especially great painters, it is not likely that painters became the illuminators of MSS. at any time, beyond the execution of the miniatures which were attached to them. There is no moderate- size miniatures as works of art to be found in any MSS., and the best of all are those executed by the celebrated Memling and his nearly contemporary Giulio Clovio, a native of Genoa, called 'il disegnatore di miniatures,' and active before the time when painting was at its highest state of perfection, which shows that the influence of the great works with Flanders and Italy then abounded reached the decoration of MSS. The miniatures of these masters (from minium or oil, red lead, blue, and green) are sometimes said to be the greater; but the reverse was probably never the case, and it would be difficult to show that painting was ever in any way improved or even preserved by the illumination of MSS. The miniatures of the sixteenth and seventeenth centuries are a mere theory founded on assumption. Constantinople always had its painters, and there is a Latin work extant of an early date probably as the ninth century, which treats of painting and illuminating MSS. and miniatures (from minium or oil, red lead, blue, and green) in MSS.

There is a MS. of this work now in the British Museum; it is by Theophilus Presbyter, whom Leonicus supposed to be the same person as Tullio or Tustulo, a monk and painter, 'pictor artifices'; of the convent of St. Gall in Switzerland. The work is printed in Leonicus Beiträge zur Geschichte und Literatur, No. vi., Brunswick, 1781. (Tullo, F. C.)

Vasari, in the Life of Don Lorenzo, evidently informs us that the writers of letters were a distinct class after the revival of painting, for he notices Don Jacopo of Florence, a monk of the convent degli Angeli, of the fourteenth century, as the most of about two hundred, and his work was a sort of self-employment only in Tuscany but in the whole of Europe. He left his convent sixteen folio choral books with miniature illuminations by another monk of the same convent, Don Silvestro, and their skill was 'so marvelling' that his right hand was enameled after their death and preserved in a tabernacle.

It appears that the earliest MSS. of Greek and Roman origin are not much ornamented, their embellishments consisting in little more than the occasional use of red ink for titles or commencementes of books. No ornaments have been found in the Hierotheum papyri. The Egyptian papyri are written in various colours; they contain mythologi- cal figures in red, blue, yellow, green, and white.

The most celebrated collection of Illuminated MSS. is that of the Vatican, already noticed, which, among its 24,000 MSS., contains upwards of fifty valuable MSS. in this collection, and gives specimens of the style of decoration, in design, from most of them. The following are the most remarkable of this collection according to Mr. Shaw ('South Ross, vol. ii. pt. 2, pp. 846-863');—Of the Western or Latin MSS. the earliest is probably the Virgil (Vatican, No. 8216), containing 50 miniatures, 44 of which are from the 13th century, and in many respects an introduction by Sir F. Madden, keeper of the British Museum. There are many papers on this subject in the Academy; and a series of articles on the Progress of the Art of Illumination in the Penny Magazine of 1839.
other accessories are picked out with gold: the date of this MS. is supposed to be not earlier than the fourth century. Among the MSS. are the Historia Sacra (Vatican, No. 453), finished in 1068, and distinguished for its writing, initial letters, and arabesque marginal decorations; it contains only one miniature—the author writing. A still more important copy for its illumination is the Panoplia fortifications against heresies (Vaticana, No. 666), executed by order of the Emperor Alexius Comnenus (1081—1183). In this MS. are three large illustrations on gold ground: two, representing the union of the same leaf—on one the father and the Greek church are bringing the materials of the book, and on the other, the emperor is receiving them; above is an apparition of the figure with the title of benediction—the third illustration, the emperor is presenting the finished work to the Saviour seated on his throne. The figures of these paintings are perhaps the best extant of this or any preceding period; they are about nine inches high, are brilliantly coloured, and the heads have much character: the costume of the emperor is on both occasions very complete; it is quite oriental, and bears no resemblance to the antient costume. (D'Agincourt, p. liii.)

There is also a beautiful MS. of the four gospels, or Evangelium, executed in 1128, in the reign of John Comnenus. The illustrations of this MS. are—Christ seated between Justinian and Theodora, representing the legal code; another with the emperor and the pope, probably Niccolo da Prato, who died at Avignon in 1321 (D'Agincourt, p. lxxii.). No. 1071 of the Palatina is a treatise of the 15th century, on falconry, by the Emperor Frederick. (D'Agincourt, p. 118.) In this period the horses are well executed, but the horses and the human figures, particularly, are bad. (D'Agincourt, p. lxxii.)

The Byzantine MSS., of which there are many in the Vatican, are better illustrated than those of the western empire; their illustrations are strictly in what is called the Byzantine style, but they are often executed with great care, and finished with remarkable detail. No. 1055 Vaticana, is a MS. of the book of Joshua, on a roll of parchment 82 feet long, of the seventh or eighth century. Rumohr (Ital. Forsch., i. 167) is of opinion that these illuminations are copies of earlier works, and that the figures are less well executed, but the horses and the human figures, particularly, are bad. (D'Agincourt, p. lxxii.)

The Byzantine MSS. is also the celebrated Menologium (Vatican, No. 1615), or part of a Greek Calendar, from September to February, with 430 miniatures upon gold grounds, illustrating the life of Christ, and of all the saints whose holidays occur in these months of the year. The miniatures, according to names inscribed upon them, were painted by — Pantaleon, Simeon, Michael Chlachernits, Georwigus, Menas, Simeon Chlachernits, Michael Micros, and Nestor. They are extremely poor in invention, but have considerable merit in the expression of the heads, in the draperies, and detail of execution: the figures in action are the most defective; those in repose are frequently natural. Their manner is generally the subject represented in the life of the saints. There are many characteristic Byzantine buildings introduced in the background. This MS. was executed by the order of the Emperor Basilius I, called Porphyrogenitus in (1059-1067), and is supposed to have been procured from Constantinople by Lodovico Sforza, Duke of Milan. It was presented to Paul V. by Cardinal Sfondrato, and placed in the Vatican Library in 1615. Cardinal Amiconi, Abbot of St. Mary of Vallo, of Cupra, and of St. Andrew in crossing together with a Latin translation, but the engravings of this edition are very inferior to the originals. (D'Agincourt, p. xxiv.—xxv.)

The rest of the Calendar was supplied from a copy of the Library of Grotte Ferrata, in which there are no illustrations.

Plater is of opinion that the best Greek MSS. are those of the period of the Commene emperors (1068-1183), which were illuminated in 1225 by the Crusaders; and particularly during the reigns of Alexius I., Johannes II., and Manuel I., and this opinion is borne out by the illuminations of D'Agincourt. Of these MSS. are the Historia Sacra (Vatican, No. 463), finished in 1068, and distinguished for its writing, initial letters, and arabesque marginal decorations; it contains only one miniature—the author writing. A still more important copy for its illumination is the Panoplia fortifications against heresies (Vaticana, No. 666), executed by order of the Emperor Alexius Comnenus (1081—1183). In this MS. are three large illustrations on gold ground: two, representing the union of the same leaf—on one the father and the Greek church are bringing the materials of the book, and on the other, the emperor is receiving them; above is an apparition of the figure with the title of benediction—the third illustration, the emperor is presenting the finished work to the Saviour seated on his throne. The figures of these paintings are perhaps the best extant of this or any preceding period; they are about nine inches high, are brilliantly coloured, and the heads have much character: the costume of the emperor is on both occasions very complete; it is quite oriental, and bears no resemblance to the antient costume. (D'Agincourt, p. liii.)

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or Attavante, a celebrated miniature painter, also executed miniatures for Matthiae Corvinus, but Vasari adds that all the MSS. belonging to the Urbinate Library were purchased by Lorenzo de' Medici, and afterwards placed in the Laurentiana at Florence. There is one at the Biblioteca Nazionale which is believed to have been purchased from this source; it was written by the Zenobius Maius in Florence in 1424, and the Codex Medici was probably not the only purchaser of these works. There is an illustrated Dantesque, which has never been published, and it was executed for the duke Federigo, and was presented at the end of the fourteenth century, and it is the last of the series. The manuscript is in the Biblioteca Nazionale at Florence, and the last is that of the death of Dante, and it is the last of the series. The manuscript is in the Biblioteca Nazionale at Florence, and the last is that of the death of Dante, and it is the last of the series. The manuscript is in the Biblioteca Nazionale at Florence, and the last is that of the death of Dante, and it is the last of the series. The manuscript is in the Biblioteca Nazionale at Florence, and the last is that of the death of Dante, and it is the last of the series. 

D'Agnicourt, pl. xlvii.) Of the sixteenth century there are, with the exception of Julio Clovio's and Memling's, scarcely any MSS. worthy of the time, and some of Clovio are injured by their excessive fineness. The miniatures of Clovio have one particular distinction from those of other earlier masters; they are executed in what is at present understood by water-colours, while those of earlier masters are done in body colours, or a species of distemper, a guazzo or a colla; the lights are relieved in white, gold, and silver. The design is both in cases previously put in fine outline. In Chapellin's "Pedia est et Universelle" one of the illustrations of the Order of the Garter in the Vatican is given as Clovio's; it is extremely highly finished. This painter, according to Vasari, spent nine years in painting the twenty-six miniatures in the manuscript of the Virgin (Uffizi, dated 1510), for the Cardinal Alessandro Farnese, now in the Royal Library at Naples. The works of Clovio, however, are not superior, and in some respects are not even equal to those of his predecessor Memling, which are more masculine in their execution. The illuminations of Memling and his scholars are in the opinion of Schorn the finest paintings of their class extent: they are more elegant and more graceful, and when painted in body colours, are quite free from the dark outlines of the Greek and Italian MSS., and have no gold but what is put on with the pencil. The most remarkable work of this class by Memling, in which he was assisted by Gerhard of Ghent and Livin of Antwerp, is the celebrated missal of Cardinal Grimaldi in the Library of St. Mark at Venice (it is described in the Kunstblatt of 1832); Memling died considerably advanced in age in the beginning of the sixteenth century. Memling, P. C. S. There were several good miniatures or miniature painters of earlier centuries, who can be mentioned by name. Oderigi of Gubbio, and his pupil Paolo Bolognese, who are noticed by Dante, are two of the earliest:—

**Memino di Avignon in 1432.** **Menni, Simone, P. C. S.** In the fourteenth century Don Lorenzo and Don Silvestro, already mentioned, Florentine monks, were also celebrated illuminators. Some of the choicest books of Don Silvestro still exist, and are among the best in Italy. Don Bartolomeo and Gherardo, of Florence, already mentioned, died at about the close of the fifteenth century. Francisco Sbar- rione, also of Padua, and his school, were celebrated illuminators. Attavante, their contemporary, is the illuminator of some of the most valuable MSS., in respect of their illuminations, now extant. Vasari attributes to him the MS. of Silius Italicus in the library of St. Mark at Venice, which is one of the finest MSS. belonging formerly to Matthiae Corvinus. In the royal library at Brussels there is a magnificent missal which Attavante illuminated for this king: it has a large folio, and comprises every page of which is decorated with arabesques, flowers, and figures. The miniatures of the two first pages and those at the beginning of the canon mass are, however, by another hand. There is also an ornamental beauty on the first page is written—"Actavantes de Actabantius de Florentia hoe opus illuminavit, a. d. mcccclxxvii. et on other is written—'Actum Florentia, a. d. mcccclxxvii.' The Hungarian scribes are often repeated, but those of Austria and Spain have been since glued over them; there are gold medallion portraits of Corvinus and his queen Beatrice of Aragon towards the end of the volume. The former regents of Belgium used to take their official seal upon this volume: the first to do so were the archduke Albert and Isabella in 1599; and the prince of Saxen-Teschen, in the name of Joseph II., was the last, in 1781. In Italy it was done at the time of Napoleon. In 1796, Charles V.; she obtained the government of the Netherlands after the death of her husband Ludwig II. of Hungary. It is described by Chevalier in the Memoires de l'Academie Royale de Litteratures et Sciences. 

Cosimo Tura, or Cosme da Ferrara, was also a celebrated miniatore of this century, but he was not equal to the Florentines. Liberale da Verona and Girolamo da L'abri were, after Clovio, the most eminent miniaturists in Italy of the sixteenth century. There was an antient geographer of the name of Agatha- dacon, who delineated and illuminated some maps for manuscrits of the Gospels, and in the Dutch MSS. with these coloured maps at Vienna, and another at Venice. Agatha-dacon's time is not known. (Heeren, Commentario de Fontibus Geograph. Photinae, &c.) The ornamental and initial letter decorations of MSS. are almost infinite, and but few of the names of these decorators have been preserved. Some of the arabesque and floral decorations are extremely elaborate and beautiful, and there are also many classes of initial letters which display extraordinary ingenuity, skill, and patience. There are many specimens of initial letters in Shaw's Ornament, &c.; Sir F. Madden, keeper of MSS. in the British Museum, in his Introduction to the Manuscripts of the British Museum, notices the various kinds of letters which prevailed in various times and various countries, and from this the substance of the following remarks are taken. The red ink or minium, cinnabar, was long used very largely, as it was by the Greeks and the early emperors; the popular was the sacred fyraxera, and was at one time used only by the emperor or for his name to imperial rescript, as confirmed by Leo, a. d. 470. This continued until the 15th century. The custom was established in the West by Charles the Bold in the ninth century, but was not continued by his successors. Gold and silver letters were common in the earlier centuries, sometimes written on vellum of a purple or rose colour. Julius Capitulorum, in his Life (c. 4) of the Emperor Maximinus the younger, mentions a present to the emperor from his mother, of the poems of Homer written on purple vellum in gold letters; this was at the beginning of the third century. By the end of the fourth century such MSS. of devotional books became common, but in other classes of literature they were still rare. The Codex Argenteus of Ulfilas, in gold and silver letters on purple vellum, of the year 360, is the most ancient specimen extant of this magnificent description of calligraphy; other early specimens are the book of Genesis in the library at Vienna; the Psalter of St. Germain des Prés; and the fragment of the New Testament in the Cottonian Library in the British Museum (Titus, c. v. x.), all of the fifth and sixth centuries. Eddius, the biographer of Wilfrid, archbishop of York, mentions a copy of the Gospels of this description, which that prelate presented to his church: this was in the year 695, and is the seventh century, and was thus richly executed, as the title. In some Greek MSS. the vellum was burnedished with gold on both sides where it was to be written upon, and was then richly ornamented with coloured arabesques, flowers, and figures. The manuscripts are kept in the British Museum; see Shaw's Illuminated Ornaments, &c., pl. 1-4.
The more beautiful MSS. of the eighth, ninth, and tenth centuries are executed in the gold letter on white vellum. The Harleian copy of the Gospels, No. 2788, and the Bible and Hours of Charles the Bald, at Paris, are among the finest examples of this kind of writing extant. (There are specimens in Prof. Abdy's 'Palaeographia Universalis.') The Charter of King Edgar to the new minister, or Hyde Abbey, at Winchester, in the year 966 (MSS. Cott. Vesp. a. viii.), is the only remarkable instance that occurs of gold writing in England; and a portrait of Edgar between the Virgin and St. Peter. This MS. is much damaged, and the ink has fallen off in many places. In the fourteenth century gold and silver writing became almost universal in manuscripts, with gold and silver along in capitals, the initials were in general not larger than the other letters. The large illuminated initials are said to have commenced first among the Greeks about the close of the seventh century. In subsequent centuries large initials were usual, and they gradually became more complicated and elaborate down to the twelfth century, when they attained such a degree of size, ornament, and intricacy, that they have not in the recent times been surpassed. Those letters are ornamented with all kinds of fanciful figures, composed of men, animals, birds, fish, and flowers. Montfaucon, in his 'Palaeographia,' gives a list of names under which these figures appear, and copies of some of what the Benedictines call, from their illustration of the text, 'Lettres Historiées;' they occur most frequently in Visigothic and Franco-gallic MS. In this alphabet T is represented by a little figure in its mouth horizontally, from the ends of which hang two cocks.

Charlemagne and his grandson Charles the Bald were great patrons of illuminations of MSS. Charlemagne's Bible in the church of St. Paul at Rome was considered by some the best example of ornamental calligraphy extant. There is another very inferior ornamented Bible, which is said to have belonged to Charlemagne, now in the British Museum, but which, according to Sir F. Madden, is of the time of theapsis of the Bald. It is described by Sir F. Madden in the Gentleman's Magazine for 1836; see also Penny Magazine, vol. viii., p. 92, 1839. It was purchased of M. de Speyer-Passavant, who had spent twenty years behind their glasses, and forty years in the collection of such MSS. of the Old Testament, for the comparatively small sum of 750L: he ascertained the trustees of the Museum originally 12,000L. The twelfth century is remarkable, says Sir F. Madden, for profusion of ornament and a greater but intricate mode of illuminating capital letters, which renders it more easy to recognize MSS. of this period than any other. See specimens in Shaw's 'Illuminated Ornaments,' &c., pl. ix. - xii., where there are many varieties of initial letters. The prevailing colours are red, blue, and green, with gold and silver. In the following century red, blue, and white were more common, and frequent yellow and green, which give a less inferior effect: they are mostly German and French. Illuminators were very numerous in the thirteenth century. In the library of Sir Thomas Phillipps, Bart., there is a MS. of this century, entitled 'Laiques,' which is a fine example of small and illuminators. In French and English MSS. of the fourteenth century, initials in purple, red, and gold are very frequent, which contain figures of men and animals, and terminate in spirals, which extend along the upper and lower margins of the page, and support small groups or single figures of dogs, hares, apes, &c. much resembling the decorative stichs and woodcuts which have recently appeared in Germany, and also occasionally in England. A Psalmist of Lord Braybrooke has beautiful examples of this style of decoration (Shaw's 'Illuminated Ornaments,' &c., pl. xii., xiii.).

The History of England, written in the year 1320, and taken continental neighbours. Among the Saxons, at the close of the tenth century, says Sir F. Madden, a peculiar style of ornament prevailed, which, for boldness, correctness of design, and richness of ornament, is worthy of our admiration. This is the character of the so-called 'Vulgate Bible,' and of the manuscripts in the British Museum collection of illuminated MSS.; the latter was given to the Duke of Bedford by Henry VI., at his coronation in France: after passing into various hands, it was several times sold by public auction, and was last bought by Sir John Tolkien in 1849 for 1100L. It is 11 inches high and 7½ wide, and contains 59 illustrations nearly of the size of the page, and about 1000 very small illustrations of borders and foliage, &c.: there is a copy of it in the British Museum. In this MS. is the only known portrait of the Duke of Bedford; the portrait of the duke, engraved by Vertue for the translation of Raphael's 'History of England,' from which the portrait of the duke, in a crimson robe embroidered with gold, is represented kneeling before St. George, who is dressed in a suit of armour, over which is the mantle of the Order of the Garter; behind the saint is his armour-bearer. This MS. was presented by the Duke of Bedford to Henry VI., at his coronation in France: after passing into various hands, it was several times sold by public auction, and was last bought by Sir John Tolkien in 1849 for 1100L. It is 11 inches high and 7½ wide, and contains 59 illustrations nearly of the size of the page, and about 1000 very small illustrations of borders and foliage, &c.: there is a copy of it in the British Museum. In this MS. is the only known portrait of the Duke of Bedford; the portrait of the Duke of Bedford, 118 leaves of vellum, measuring 11½ inches in height, and forming a series of 118 drawings; and it is considered the most valuable MS. of the Cavendish collection. See Mr. Gage's ' Dissertation on the St. Ethelwold Benedictine,' in the 'Archaeologia' (vol. xxiv., p. 224), where the illustrations are engraved. Another curious MS. of this time, now in the British Museum (Cott. MSS., Thib. b. v.), valuable for the pictorial illustrations of old English habits and costume, is a 'Saxon calendar, in which the account of each month is headed by a drawing illustrating the agricultural occupations of the respective months of the year. Julius A. vi. is a fine MS. of the same description. B. iv. is also a remarkable MS. It contains the first six books of the Bible in Saxon and Latin, with notes by Bede and others, and many drawings illustrating the principal passages; it is of the eleventh century. No. 608 of the Harleian MS. contains a long series of illustrations of Anglo-Saxon customs, in very curious designs in outline, executed in various coloured inks; and though the execution is rudimentary, the attitudes and portrayals are well worth consideration.

In the Cott. MSS., Cleopatra c. vii. of the same period there is a comparatively very superior drawing of a party at near drinking together; the poses of the figures are excellent, and the heads and hands are perfectly intelligible and expressive; it is engraved in the Penny Magazine, vol. viii., p. 70, 1839, where there are also a few other cuts from some of these MSS. In the thirteenth and fourteenth centuries Saxon MSS. are comparatively rare: the majority of the MSS. of this period are French.

There is a Psalter in the British Museum, supposed to be of English origin, of a very fine good the representation of some or more probably of the early part of the fourteenth century (Reg. 2 b. vii.), in which the drawing of the period is much better represented than in MSS. generally: some of the illuminations in this volume, containing 390 leaves, are of a very high order; sixty-five are illustrations from the Old Testament, in transparent water-colours, in the usual style of such decorations, the designs being drawn in black outline, and the colours lightly washèd in. This Psalter is followed by drawings of saints in body-colours, which are likewise prepared in black outlines; but in these body-colour drawings the outline is frequently painted over; then follows a Calendar. The greater part of the volume is occupied by the visions described in the 'Vulgate Bible,' and is multiply ornamented with designs, many illuminating the history and habits of the time. This book was presented to Queen Mary in 1553, and is in the library of Lord Willoughby de Broke. There are some French MSS. of the same period in which the illustrations are equally good, as the 'Life of St. Germain des的关系 Le Geste des Roys de France,' both folio volumes, with numerous illustrations. On the last page the words 'C'est livre est a moy Hosmery De Gloucestre de don des executors de sr. De Fauchere.' There is also a French MS., called the Metrical History of the Life of Richard II., preserved in the British Museum, which contains some beautiful illuminations. It is translated in the 'Archaeologia,' vol. xx., by the Rev. John Web. There are three cuts from these MSS. in the volume of the 'Penny Magazine' already quoted.

One of the most interesting French MSS. of the fifteenth century is the celebrated Bedford Missal, executed for John Duke of Bedford and regent of France, in the reign of Henry VI., now in the possession of Sir John Tolkien at Liverpool. It is 11 inches high and 7½ wide, and contains 59 illustrations nearly of the size of the page, and about 1000 very small illustrations of borders and foliage, &c.: there is a copy of it in the British Museum. In this MS. is the only known portrait of the Duke of Bedford; the portrait of the duke, engraved by Vertue for the translation of Bapin's 'History of England,' from which the portrait of the duke, in a crimson robe embroidered with gold, is represented kneeling before St. George, who is dressed in a suit of armour, over which is the mantle of the Order of the Garter; behind the saint is his armour-bearer. This MS. was presented by the Duke of Bedford to Henry VI., at his coronation in France: after passing into various hands, it was several times sold by public auction, and was last bought by Sir John Tolkien in 1849 for 1100L. It is 11 inches high and 7½ wide, and contains 59 illustrations nearly of the size of the page, and about 1000 very small illustrations of borders and foliage, &c.: there is a copy of it in the British Museum. In the Cott. MSS. (MS. 4425), the collection presented by Talbot Earl of Shrewsbury to Margaret of Anjou (Royal MSS., 16 E. vi.), and the poems of Christine de Pisan (Harl. 4431), while the feats of arms and chivalry, by the same author, were des
Fais d'Armes et de Chevalerie," written in French in London in 1434 (Harl. MSS. 4605), is so inferior in its illustrations, that it presents a great contrast between the states of the art of illumination in the sixteenth and the fifteenth centuries. The "Pomme de la Rose" is rich in beautiful miniatures; it is supposed to have been executed towards the close of the fifteenth century; it is a folio volume, measuring 104 inches high by 112 inches wide. The 185 leaves are illuminated and glazed. A single column, the initial letter of every paragraph being illuminated. This French poem is of the sixteenth century; it is a dream, and was commenced by William de Lorris and finished by his companion, de Malus. The work is divided into 100 chapters, and contains 22,000 verses. It has been several times printed, and last at Paris in 1814, in 4 vols. 8vo. The British Museum MS. is considered the most beautiful of the poem extant; the illustrations are probably Flemish. (Dibdin, Bibliographical Decameron.)

The Anglo-Saxons were for many centuries among the best illuminators, and the Irish also obtained great celebrity in this art at an early period. This British or Hiberno-Saxon school of illumination shows a distinct character, as seen from the so-called 'Durham book, or St. Cuthbert's Gospel,' of the beginning of the eighth century, now in the British Museum. The initials, observe Sir F. Madden, are characterized by an extreme intricacy of pattern, interlacing of knots, in a diagonal or square form, sometimes interwoven with animals, and terminating in heads of serpents or birds, to which may be added an 'Airish detached type.' The edges of the larger letters. The Lombardic and Valli-Gothic letters are tessellated and embroidered. There are no British illuminations later than the reign of Henry VII.; and at this time they disappeared.

After the establishment of printing and consequent multiplication of books, MSS. became gradually more rare, though they were still occasionally executed as articles of luxury even as late as the eighteenth century; but their immense price, compared with that of printed books, must naturally have so limited the demand, that they can only have been required as works of art and curiosities in calligraphy, not as books. The writing of many MSS. is so beautifully executed, that probably no movable type has ever equaled the manuscript characters in beauty, and they have perhaps not even been surpassed in equality of execution and finish. See the fac-similes in Sylvester's 'Psalteriographia Universelle.' Perhaps the latest, says Sir F. Madden, or one of the latest illuminated missals, is the immense folio in the library of Rosen, which is nearly three feet high, and cost the monk of St. Andoen, who illuminated it, thirty years of labour: it was completed in 1682.

PALEOAZRA/MIA, a genus of fossil Cycadeid plants, from the oolitic and lias deposits of Yorkshire, Dorsetshire, and Oxfordshire.

PALANQUIN (sometimes written Palankeen, Palanquin, and Pallo), a kind of covered litter carried, by means of poles, upon the shoulders of men, which forms the principal conveyance for the conveyance of state. A very minute description of an ordinary palanquin, together with an amusing account of a dawk or donkey journey, which is the same given to the mode of travelling long distances by the palanquin, is given in the 'Works of the Travelers of the Holy Land,' third series, vol. ii., chap. vi., where the palanquin is described as about six feet long by two and a half feet wide, and provided with conveniences which enable it to serve night-time for a bed, and in the day-time for a parlour. In the front part is usually a broad shelf, with a drawer underneath, and a net stretched above it; and in the hinder part is often a shelf for books, a native of China and other loose articles, and hooks for hats, towels, etc. In each side of the palanquin are two doors, or sliding partitions, with Venetian blinds in the upper panel, and in each end are two small windows. As, owing to the heat of the country, travelling is performed much by night, palanquins are often furnished with a lamp at one corner, so fixed as to throw its light into the interior, but to be trimmed from outside. The bottom, or seat, is made of strips of rattan, like that of a cane-bottomed chair, and is covered with a light elastic material stuffed with horse-hair or shavings produced in dressing the bamboo and rattan. Across the palanquin, at about eighteen inches from the hinder end, is the pole for supporting the bearer's back to receive the weight of the passenger, and below it a broad belt which may be adjusted to the height, or to the length of the passenger's legs, or the choice of position. In the space behind the seat clothes and pillow are stowed away during the day; and the sheets, draperies, and nets afford facilities for the conveyance of baggage, canisters, sharing of seat with the passenger, protection against the materials, and a sufficient supply of clothing to prevent inconvenience if the traveller be separated for a time from his heavy baggage. Flat articles may be laid beneath the mattress, and bottles and glasses may be stowed in the cupboard at the end of the palanquin. A cover of waxed cloth is affixed to the top in such a way that it may be rolled up when not wanted, and let down as completely to envelop the palanquin, in rainy weather. The same is done in the case of the goglet, or gorget, of porous earthenware; and as the water which flows through the pores of the goglet is rapidly evaporated by the current of air, its contents are always kept cool in the hottest weather. The action of this apparatus is identical with that of the alucrazas of Spain, described under Cools, P.C., p. 498. On the hinder pole are carried, in like manner, a kettle, coffee- pot, and wooden wash-hand-basin. As the poles, which rest upon the shoulders of the bearers, are not elastic like those of a sedan-chair, Captain Hall states that a palanquin has not the same unpleasant motion as that vehicle; and Bishop Heber also, who gives an account of dawk travelling in the 'Narrative of A Journey through the Upper Provinces of India,' published in 1824, speaks of the latter as 'a very heavy, whether neither violent nor unpleasant,' but that, being incessant, it is impossible to draw in a palanquin, and not very convenient to read, excepting a large print. In the first edition of this work there is also a general description of dawks, according to which the bearers can, in an ordinary palanquin, place their shoulders beneath the poles, two at each end; but in passing over difficult ground two others will occasionally assist at the back part of the carriage by pressing a bamboo under the body of the quin. In most cases the bearers follow one another in a straight line; but in some districts it is the custom to proceed obliquely, in which case the sideways motion is said to be exceedingly unpleasant to the traveller. While walking or running with their load, the bearers, who form a peculiar caste among the Hindus, keep up an incessant noise, sometimes like grunting or groaning, and sometimes approaching the character of a song, or of wild vociferation. Captain Hall has some curious remarks on this subject.

In the 'Pictorial Bible,' in illustration of a note on Solomon's Song, iii. 9, are representations of the 'J'Alladar, or state palanquin of Hindustan, and also of a similar vehicle used by the ancient Egyptians; and some further information on conveyances of this character is given in the article 'Litter' in the Cyclopaedia of the Holy Land.

PALECHI/NUS, a genus of fossil Echinozoa from the mountain-limestone of Ireland. (Scorler.)

PALESTRA, GIOVANNI PIERLIGI. Da Campra, born at Palestrina, near Rome—the ancient Pristium—in the year 1524, a date which, though with some hesitation for want of direct evidence, has been fixed by the Abbé Bini, who devoted thirty years to collecting material on the history of Palestrina. Of his family nothing is known, except that his parents were mean in rank, and in circumstances corresponding to their station. The name of the master who is entitled to the credit of having instructed him in an art in which he became so famous was involved in some doubt, but after diligent research the honour seems to have been justly awarded to the Claude Goudimel, a native of France, a disciple of the Franco-Belic school, a Hugenot, and one of the victims of religious bigotry in the massacre of 1572, the Catholics on St. Bartholomew's day having thus resented his heresy in setting to music Clement Marot's and Theodore Beza's metrical version of the Psalms.

Palestrina was appointed Master of the Chapel to Pope Julius III. in 1551, to whom in 1554 he dedicated his first work, consisting of four books of Psalm- settings. To reward the composer, placed him among the singers of the Pontifical Chapel, who were well paid for their services. The college of chaplain-singers demonstrated, and pleased the Pope so much that he proposed that Palestrina should be associated with them unless elected by a majority of themselves. But in vain. The mandate of the infallible tiara was obeyed, though not without the kind of vexation that may be sufficient to baffle a man's heart. He proceeded to the papal throne, under the title of Paul IV., who, finding that Palestrina had quitted a state of celibacy, which
all the higher appointments in the apostolic chapel enjoined, abruptly dismissed him, and for some time he felt severely his strained circumstances; then gladly accepted the place of Maestro di Capella of St. John in the Lateran, which he exchanged in 1811 for the lucrative pastorate at Santa Maria Maggiore; and in 1817 was restored to his post in the Vatican. Up to the year 1856 he composed many works for the church, among which Bini, especially mentionous the three Masses, dedicated to himself, was the attempt for a perfect adaptation of music to the sense of the words. 'To hear them as executed on Good Friday in the Sistine Chapel,' says the abbé, 'the mind is subdued by emotions of tender- ness and awe.'

During the above period, however, the Council of Trent, among other matters, took the state of ecclesiastical music into serious consideration, and approved two or three manuals which they charged with its reform, who called to assist them a committee of eight selected from the college of chaplain singers. Much discussion arose out of the case. The cardinals reasonably demanded the abolition of all the secular tunes which had been recklessly foisted into the sacred service, many of them vulgar, some obscene, and required more simplicity in the music. The singers irritatedly defended the melodies, and Bini, who was about to publish a collection of his Masses, urged that Palestrina should write a mass on the principle laid down by their Emminence, and on his success depended the fate, at that time, of music in the Catholic church. In consequence of this discussion, the Council, after some further debate, decided in favor of six voices.

The two first were rather coldly approved, but the third was considered as the perfection of art, and the singers, on whom a ray of common sense had now fallen, could not restrain their expressions of admiration even during its performance. This is known under the title of 'the Mass of Pope Marcellus.' He applied all his powers on the work, and wrought himself up to the most enthusiastic pitch. On his manuscript were found the words 'Domine, Plenitudo sanctorum.' The pope, 'before whom this mass was performed, was enraptured, and compared it to the heavenly melodies which the apostle John heard in his ecstatic trance.' By this one great example the present generation was now for ever set at rest,' says Ranke (in his 'History of the Popes,' acknowledging Bini as his authority); 'a path was opened, in following which the most beautiful, the most touching works, even to those who are not of the church, were produced.'

This art, which had been perhaps more completely alienated from the spirit and service of the church than any other, now became the most closely connected with it. Never before had the church been more spiritual in its sentiment and rapture were the favourite themes of poetry and painting. Music, which speaks a language more direct, more impressive, more adapted to express ideas and emotions, was within the reach of all nations, and thus subjugated all minds to her empire.

The restoration of Palestrina to his office, his fame spread widely, Cardinal Paccecco announced to him that Philip V was disposed of Spoleto. The story is mentioned by the composer that he might dedicate to him. To his other appointment was now added that of Maestro to the congregation of the Oratory. He undertook the direction of the school established by his patron, Gio. Martini. Soon after this he was charged by Pope Gregory XIII. with the task of revising the Roman Gradual and Antiphoner, which, however, he did not live to complete, but performed by his son, now living in Vienna. Rather than to be disappointed, his pen spirituous circumstances must have been much improved, for on his death-bed, after blessing his son, he added, 'I leave my son with God's blessing.'

On the 26th of the following month, after receiving the last rites of the church from the hands of his friend (the future Saint) Filippo di Neri, he expired. Of his funeral, Terriglio (Grotte Vaticane, ii. 166) says, 'In St. Peter's church, near the altar of St. Simon and St. Jude, was interred, in consequence of his similar circumstances, the body of Palestrina, the great musical composer, and Maestro di Capella of this church. His funeral was attended by all the musicians of Rome, and Liberam me, Domine,' as composed by him, was sung. The inscription is,

Johannes Petrus Aloysius Prænestinus, Musæum Princeps.'

Palestrina's music is learned and grave, and it was written for the church—as well, indeed, as much that proceeded from the same school—when heard in the kind of place for which it is adapted, and attended by pomp and pageantry, is strongly felt by all, and acts with irresistible force on sensitive minds. But in the concert-room or chamber, his compositions, whether sacred or secular, have, with few exceptions, no charms for hearers who have not cultivated a taste for simple, solid, airless harmony, or for the intricate and incoherent points well woven with a skill that owed more to study than genius.

His works are exceedingly numerous, chiefly ecclesiastical; but including also many madrigals, now rarely performed, even in societies devoted to this species of music. Choral, as these are, their dryness is undeniable, and they are praised by many who derive no pleasure from their performance. Three of his motets are in use in our cathedrals, adapted by the Bishop of Bath and Wells, the Bishop of Winchester, and Sir C. W. Yonge in his 'Musica Transalpina' (1858), a work containing twenty madrigals by Italian masters; and this is the only published collection of Palestrina noticed in Le Musa Madrigalica (1857); an elegant, interesting volume, comprising the words of 386 compositions, chiefly madrigals, 'of the Elizabethan age,' together with many translations from the Italian, and some English paraphrases. The Padre Martini, in his 'Storia della Musica,' has given two madrigals, and several extracts, from the works of this celebrated master, all of them evincing his deep knowledge of the art, as understood and practised in his time, but all exclusively confined to this style now distinguished by his cognomen—by the term alla Palestrina.'

Within the city of Palestrina, there was a genus of plants belonging to the natural order Cichoracese. The limit of the calyx is 5-toothed or 5 lobed, or nearly entire; the corolla tubular and cyp- tral, and a little wider above; at the base is a ring of hair, bearded beneath the middle inside. The teeth of the calyx and corolla sometimes rather unequal. The species are American shrubs wholly destitute of pubescence. The leaves often curled and of a tint of pale yellow. The pericarp is white in terminal sessile or stalked panicles, thyrse, or cymes. P. Marcipravitii is a shrub from 5 to 6 feet high, and has smooth quadrangular branches. The leaves are short-stalked, oblong, acuminate, obfine at the base, smooth; the stipules interpetalior and tridif. The calyx is 5-toothed and downy; the corolla from 5 to 7 lines long, slightly curved, gibbous at the base, rough downy yellow-coloured below, purplish above, closely bearded with hairs inside. Sometimes the leaves are downy beneath. It is a poisonous plant, used in Brazil to kill rats and mice. Very little is known of its real properties.

P. croceus has a smooth stem, ovate or oval lancesolate leaves acute at the base, rough on the edges, generally three pairs of by the side, linear, acuminate, twice as long as the petiole. The panicle is conical, terminal, and suffrut- cious. The corolla is corymbous and tubular, the anthers projecting from the tube shorter than the limb. The tube someway double. It is a native of Porto Rico, Trinidad, Cuba, and Guad- aloupe. According to Von Martius this species is emetiv.

P. speciosa has a round whitish or pinkish leaves acute at the base, membranous, roughish, shining, with smooth stipules. The panicles are stalked, their angular branches corolla hairy and downy. The leaves have by their yellow, yellowish, sometimes whitish, for the sake of being a shrub, highly spoken of in Brazil as an antispasmodic. 'The decoction, which in large doses forms a real poison, acts especially by an increased action of the skin and kidneys, and the digestion is not injured by moderate doses.'
P. officinalis is a shrub clothed with harsh yellow down in every part. The leaves are narrow, elliptical, short-stalked, acute, or rounded at the apex with a mucronated tapering tip at the base. The flowers are small, greenish yellow, in June. It is native to Europe and Asia, and is used in herbal medicine for various purposes, such as treating stomach complaints and menstrual problems.

P. vulgaris is a shrub with smooth, green leaves and white flowers in June. It is native to Europe and Asia and is used in herbal medicine for various purposes, such as treating stomach complaints and menstrual problems.

The island, the Pico, the Muchachos, which attains 7712 feet, the Pico de Santa Cruz, which is 7549 feet, and the Pico del Cerro, which rises to 7292 feet above the sea-level, are striking features in the southern section. The Pico de Levada, situated nearly in the centre of the island, is 4586 feet above the sea. Towards the southern extremity of the island, there are low mountains, which are called the 'Zarcos', and are formed by deep ravines, called barrancas, whose bottoms are frequently 500 feet below the adjacent ground, and the sides very steep. They are most frequent in the high mountains, and are sculpted by the wind, which blows so powerfully that the sand is swept like rays diverging towards the sea; but they have no communication with the crater, with the exception of the Baranca de Augesta, on the west side of the island, which originates in the crater itself, and is called the 'Baranca de Tazacorte', and in which the only river runs which has water all the year round. It waters the Llano de Llanos, an uneven plain situated on that side of the island which is the best portion of the whole, and at present contains the only plantations of sugar-cane in the Canaries. The sides of the mountains are very steep, and covered with high forest-trees that yield several kinds of good timber. This is especially the case in the northern districts, where the soil retains the moisture, and in these parts springs are frequent and abundant all the year round. In the southern districts the soil consists partly of lava or of other dry volcanic matter, and there are no springs. In these parts the winter is very long and severe, and there is a great degree of fertility; but with the exception of the Llano, the cultivated tracts occur only on the very shores of the sea, or at a few places on the lower terraces of the mountains.

The climate of Palma is superior to that of the other Canaries in its neighbourhood. This is partly attributed to the extent of the mountains, which for several months are covered with snow and wood, which cover a large portion of its surface. The north-east trade-wind, which blows from spring to autumn with considerable force, diminishes the heat, which otherwise would be insupportable along the coast itself. The winter, except in the most elevated parts, is so mild that it is compared with the springs in southern Europe. Earthquakes are not rare, and two volcanic eruptions in the southern districts, in 1566 and in 1678, are recorded.

Palma resembles Teneriffe in its productions. Wheat, barley, rye, and potatoes are cultivated to some extent, and also a small quantity of Indian corn, but the crops are far from being sufficient for the consumption. The deficiency is made up by the root of a kind of fern, called helecho (Plera aquatica), which grows wild on the small hills in the calderas. It is mixed with flour, or even used alone for making bread, which is as black as rye bread, and is said by Von Buch to constitute the principal article of food for two-thirds of the inhabitants. The isle is still grown in the county, and the Llanos, where the crop has been habitually grazed and trampled, the work of Palladus appears to be materially a compilation from previous writers, such as Columella and Martialis Gar- gilius, whose work on agriculture and garden cultivation was lost. The style is inferior to that of Columella, and indicates a late period. The work of Palladus, probably owing in some degree to the convenience of the division, was much used in the middle ages, and the 'Speculum' of Vincent of Beauvais has borrowed much from it.

The population amounted in 1869 to 28,878 individuals, but MacGregor states it in 1830 to have increased to 33,000. The people are descendants of Spaniards, who settled there at the time of the conquest, and of a few Flemish families. They are remarkable for the oddity of their language, consisting of sugar, almonds, fruits, deals and timber, pitch, charcoal, raw and manufactured silk, brandy, and orchilla. They import European goods, oil, grain, potatoes, salt-fish and flour.
P. frutescens is also used in China and Cochín-China as a febrifuge, and as an astringent tonic. It has a shrubby unarmed stem, pinnately decomposed leaves; petiole oval oblong leaflets eburneously and dentately serrated, the ultimate ones deeply trillate and narrowed into a petiole. The flowers are umbelliferous at the apex. It is a native of the islands of Ternate, Java, and Amboyna.

The hardy species of this genus grow best in pots, and are propagated by the ordinary methods, or by cuttings of the rooted portion of the reseeds. They are grown in a mixture of loam and sand, and are propagated by cuttings, which should be planted in sand with a hand-glass over them.

(Don's Gardener's Dictionary; Lindley's Flora Medica; Garrett's Outlines of Horticulture.)

PANVINIO, ONUFRIIO, was born at Verona in 1529. He took an early age the habit of the order of St. Augustin, and pursued studies at Rome, where he was called to Florence in 1544 to fill the chair of theology in that city; but soon afterwards, at his own request, was superceded in the office, and obtained leaves from his superiors to visit the chief cities of Italy in order to collect inscriptions. At Venice he became acquainted with Sigonio, who had been appointed professor of belles lettres in that city in 1559, and who was not less enthusiastically attached than Panvinio himself to the study of antiquities. The acquaintance soon ripened into a lasting friendship. At Rome he was patronised by Cardinal Cervini, who in 1555 became Pope Marcellus II., and by him Panvinio was appointed to a situation in the library of the Gregorian college. The pope however died a short time after his election; and Panvinio was then patronised by Cardinal Farnese, who gave him apartments in his palace, admitted him to his library, and treated him with the greatest liberality. Having accompanied the Cardinal in a voyage to Sicily, he was taken ill at Palermo, and died there April 7, 1658, at the age of thirty-nine.

Panvinio was a man of great learning and indefatigable industry. Niceres, in his 'Mémoires,' mentions twenty-seven of his works which had been printed; and Maffei, in his 'Verona Illustrata,' gives a list of his manuscripts in different libraries of Italy and abroad. The chief of these are the following, some of which were not printed till after his death:—Epitome Pontificum Romanorum usque ad Paulum IV.; Venice, fol., 1557; Viginti-septim Pontificum Romanorum Elogia et Imagines, Rome, fol., 1568; Pasti et Triumphi Romanorum a Romulo usque ad Carolum V.; Venice, 1557, of which Mader published another edition in 1662 at Helmstatt; In Fastos Consularum Appendix; De Ludis Secularibus et Antiquis Romanis; et al. De Antiquitate et Virtu Illustrissimae Veronae Libri VIII.; Padua, fol., 1648. The following treatises are contained in the great collection of Graevius, 'Thesaurus Antiquitatum Romanarum':—De Civitate Romana; De Imperio Romanis; in vol. i.; De Antiquis Romanorum Nominius; in vol. ii.; 'Antique Ursis Imagin'; in vol. iii.; 'De Ludis Circensibus,' 'De Ludis Sacrisculibus,' and 'De Triumphi Commentarius,' in vol. IX. His great treatise 'De Cerimonibus Romanis' was published in four folio volumes, in 1568; the first three were issued at Venice, the fourth (consigned to Dornus, his publisher) in the arrangement of Boisduval, and Dornus in that of Latrelle, corresponds with the Linnaeus genus Populorum. The insects composing it have mostly thin and elongated integuments, terminate beyond the claws, and the male abdominal segments are usually variously shaped, have six pectoral, eight abdominal, and two anal teeth. The pupa are usually angulated and, with a few exceptions, naked. The perfect
insect varies in size from less than an inch across the wings when expanded, to nearly a foot in breadth. Equally variable are their colouring and outlines. They are short-lived. There are very great differences in the mode of flight which varies in the several species. The males are usually more gaily coloured than the females.

The arrangement according to natural relations of the species of butterflies has been attempted by many naturalists. Even in the time of Linnaeus the number and variety of known species was such as to render it necessary to subdivide his great genus Papilio. He constituted five principal groups. In the first of these, named Eupides, he included such butterflies as have the fore wings longer from the posterior angle to the apex than to the base. In the second, the Heliconii, the wings are narrow, entire, and often almost naked. The Danaius has the entire wing margins. The nymphalides have the marginal wings; and the group of Plebeii was composed of small species, whose larvae are usually short and thick.

Dr. Horsfield has proposed an arrangement of these insects into five groups or tribes, characterised by the peculiarities of the larvae. He names the first stirs, Vermiformis, the second Jufiform, the third Scopendris, the fourth Thy amoniform, and the fifth Anaplariform.

Perhaps the most valuable arrangement of the diurnal Lepidoptera is that proposed by M. Boisduval, who divides them into three great sections and fifteen tribes, as follows, founding his classification upon the characters of the larvae:

Chrysalis attached by the tail, and also gilt.

A. Six feet in both sexes: caterpillars elongated.
   Tribe 1. Papilionides.
   Tribe 6. Paraidades.

B. Six feet in both sexes: caterpillars short.
   Tribe 3. Eumenides.
   Tribe 4. Lecydonides.

C. The males with four feet, the females with six: Caterpillars short.
   Tribe 5. Erycides.

D. Four feet in both sexes: caterpillars elongated.

E. Chrysalis suspended by the tail only.
   A. Ungues of tarsus simple. Four feet in both sexes.
      Tribe 7. Danaides.

B. Ungues of tarsus strongly bifid. Four feet in both sexes.
   Tribe 11. Morphides.

C. The males with four feet, the females with six: Caterpillars elongated.

Chrysalis enclosed in a cocoon.

Tribe 15. Harpoides.

See Boisduval in the Species et Effets and his other works: Wood, Index Entomologicus; Horsfield, Catalogue of Lepidoptera in the Museum of the East India Company; and Westwood's Modern Classification of Insects, where an enumeration of the principal treatises on butterflies may be found.

PAPIRUS, SEXTUS or PUBLIUS, is the collector or supposed collector of the old Leges Carinates, or as they are sometimes called, Leges Regiae, which were enacted at Rome during the kings of Rome. This Papiorius is said to have been Pontius Maximus and to have lived under the last Tarquin. The few and doubtful fragments of this supposed compilation are contained in Hoffmann, Hist. Juris, vol. ii. p. i. The collection is mentioned under the name of Jus Papirium, not because he added anything of his own, but because he arranged the laws in due order (Pomponius, Dig. 1, tit 2, s. 2, 1, 2); and sometimes it is called Lex Papiria. (Servius ad Virg. Aenid, xii. 886.)

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area from the dispersion of the stones when shot or shells are fired into the mass; and the slopes, as well as the banquettes, are usually covered with turf.

Paraseleæ (from σάρκα and σαλαμάς the moon). This name is given to the ill-defined and faintly luminous disc, apparently round, but surrounded by the moon, as the corresponding but brighter spots which are seen in halos about the sun are called parhelia. [HALO, P. C. S.] The phenomena of paracelsus and paraseleæ are ascribed to a like cause; that is, a blending of the rays of light reflected from the parallel sides of small triangular plates of ice with those which are refracted through the sides containing one of the angles.

One of the earliest recorded phenomena of this kind is that which was observed by Hevelius at Danzig in 1660: a double halo surrounded the moon, with coloured segments nearly resembling those which are represented in the second figure in the article above referred to; and in the inner circle at each extremity of a horizontal diameter was a false moon: it was faintly tinged with colour and, at intervals, beams of whitish light proceeded from it towards the exterior.

Sir Edward Parry, during his voyage to Melville Island, saw several lunar halos with paracelsus; and, once, very nearly the like phenomena occurred on two successive nights. The observer, in the articles above, directed to discover the omens of a horizontal diameter, and one at the upper extremity of a vertical diameter; while from the real moon proceeded vertical and horizontal brushes of whitish light like the four arms of a cross. On one of the four extremities of light issued from the eastern moon, like part of a second halo, and at times ascending almost directly towards the zenith. Another time the moon was surrounded by a double halo, and on the circumference of the inner circle appeared a double paracelsus, at the opposite extremities of a vertical and a horizontal diameter.

Parent-Duchâtelet, ALEXANDRE-JEAN-
BAPTISTE, was born at Paris on the 28th of September, 1790. His father held an office under government which had been in the family for upwards of three centuries. At the birth of Alexandre he was possessed of considerable wealth, and his father had already seriously affected his circumstances, and he retired to a house in the country called Châtelet, about a league from Montargis. Here Alexandre, who was the eldest of five, was brought up with little further assistance in his education than could be given by his mother, who was an amiable and accomplished woman. He was, however, fond of study, and early exhibited a taste for natural history by collecting the insects and birds of the neighbourhood.

At the age of seventeen he was sent to Paris, where he commenced the study of medicine. In 1814 he took the degree of doctor of medicine at the University of Paris. He became early dissatisfied with the practice of medicine, and directed his attention to pathology. One of the earliest works which he published was upon inflammation of the lungs. This was published in 1816 by M. Martinet; the title is "Recherches sur l'inflammation de l'arachnoïde cérébrale et spinale, ou Histoire thêorique et pratique de l'arachnitis," Paris, 1821. This work is a valuable monograph. The mind of the author was however shortly after directed, through the influence of Hallâ, to the subject of public health, and from the period that he first thought upon this subject to the day of his death, he devoted all the energies of his mind to it. From 1821 to 1836 he published twenty-nine memoirs and papers on various questions relating to public health. One of his first efforts on this subject was a series of papers on the different causes of a disease which had occurred on board a vessel which was conveying poudrette across the seas. Parent examined the manufacture of this substance, which consists of animal and vegetable matters which have been collected from the drains and sewers of Paris, and, being exposed to the sun and air, are allowed to dry. In this state it is used as a manure. It was the fermentation of this substance, its conjunction with moisture, that had produced the disease, and Parent recommended that in future plasters of Paris should be mixed with it, which prevented the recurrence of such catastrophes.

His next work was on the common sewers of Paris, entitled "Essai sur les Cloaques ou Égouts de la Ville de Paris, envisagés sous le Rappor de l'Hygiène Publique et de la Topographie Médicale de cette Ville," Paris, 1828. Parent-Duchâtelet here displayed the peculiar acuteness of his mind for the investigation of subjects which others regard with natural abhorrence. He not only made inquiries into the state of the health of the workmen employed in cleansing these places, and obtained from them much important information, but he entered with them the places of their noseless and illogical congeners, and, in various reports, reported on their condition and nature. Shortly after the publication of this work, Parent was appointed on a commission to superintend the emptying of one of these sewers (égouts) which had been blocked up for years, and which threatened to generate fever of the worst kind. Under his direction this place was cleansed without the loss of life to a single workman, and without any evil results.

He subsequently contributed largely to the Annals of Hygiène Publique et de Médicine Légale. In this work he will be found reports and papers by him on the influence on the health of workmen and the public, of tobacco manufactories, of pyroxyline-acid factories, of employments requiring immersion of the feet in cold water; of burying the dead in cities; of putrid emanations from dead animals and vegetables, of dissecting-rooms, &c. He also published a work on the progress of cholera, and a history of its ravages in Paris. His greatest work, and that which most displays the industry and character of the man, is that on prostitution in the city of Paris which he published in 1839, and which he wrote, not with the title 'De la Prostitution dans la Ville de Paris considérée sous le Rapport de l'Hygiène Publique, de la Morale, et de l'Administration,' Paris, 2 tomes. 8vo. 1836.

Parent-Duchâtelet died of inflammation of the lungs, on the 7th of March, 1836. Few men have led a life of greater usefulness, and his labours have assisted in laying the founda-


PAREXUS, a genus of Placoid fossil fishes, from the old red-sandstone of Scotland. (Agassiz.)

PARIETARIA, a genus of plants belonging to the natural order Umbellifera, and having a numerous number of flowers. The flowers are dry and of a fibrous style. One species, P. officinalis, Wall. The flowers, leaf, or chlorella ovate leaves, without lateral ribs at the base, two axillary biform cymes, the segments of the involucre ovate obtuse. The leaves are alternate, the flowers small and reddish, the fruit black and shining. It is a British plant, and is found on old wall and rubbish. It is the P. eucuma of Koch and Reichenbach.

(Babington's Manual of British Botany.

Parent-Duchâtelet.

PARIS, a genus of plants belonging to the natural order Asparagaceae. It has a patent horizontal perianth, 8-parted to the base, the four inner petals or corolla narrower than the others. There are 8 stamens, the flowers fixed to the middle of a column, and antheroid filaments. The styles are 4 in number, the berry 4-celled, the cells from 4 to 8 seeds."

P. quadrifolia, Herb París, the only British species, has usually 4 leaves in a whorl, a stem about a foot high springing from the extremity of a long rhizome usually with 4, occasionally from 3 to 6 leaves at its summit. The flowers are solitary and terminal, the sepals lanceolate, the petals subulate. It has no root-leaves and is found in damp woods in England. It is considered to be a narcotic-acid poison.

P. polyphyla, a native of Nepal, possesses similar properties and effects. (Babington's Manual of British Botany; Burnett, Outline of Botany; Lindley's Vegetable Kingdom.)

PARMELIA. (Lavrenvorts, P. C. S.)

PARNASSIA (from the name of Mount Parnassus), a genus of plants belonging to the natural order Droséeraceae. It has a 5-cleft deeply-cleft calyx, 5 petals and 5 stamens, with 5 scales fringed with glandular seta inserted. The stigma is septic and 4 in number, the capsules 1-celled with 4 valves. The species are smooth herbs. The leaves ovate, cordate, cordate, usually clasping the stem or leafy. The flowers are all white striped with green; the seed of the glands.

P. palmata, Marsh or common Grass of Parnassus, has cordate stalked radical leaves, the stem-leaves amplexicaule, the filaments of the petaloid scales from 2 to 18; the petal has a short claw, and is white and veined; the glands of the
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scales yellow. It is native throughout Europe, in marshy and damp
places, and in Britain in moist mountains. *P. fimbriata* is a very
elegant species; the leaves are remarkably hollowed out at the base
close to the lateral ribs, which are connected with one another by a
common base like the 'tendril leaf.' It has a fine tuft of
branched, glandless, pendulous, oblong petals fringed at the base.
It is native of the western coast of North America.

The species of this beautiful genus grow best in a peat soil and
convenience. They must be grown in pots, which should be placed
in pans of water. They may be propagated by dividing at the
root, or by seeds, which ripen in plenty. Plants must be introduced,
as seeds do not vegetate after a season of rest.

(Don’s Gardener’s Dictionary; Babington, *Manual of
British Botany*).

PARNY, EVARISTE DESIRE DESFORGES, Chavaller and afterwards Vicomte De Parny, was born in the Isle of Bourbon, on the 6th of February, 1753. At the age of nine he was sent to France and placed at the College of Rennes; but he appears to have shown considerable indif-
ference to the course of studies which were followed there.

His imagination, which even at an early age had taken the
almost entire guidance of his conduct, impressed him as he
grew up with the belief that he was made up to enhance the
terrible effects of his genius; it is said that he attempted to
join the brotherhood of La Trappe. An effort of improp-
der zeal, however, on the part of the confessor whom he had
called his spiritual guide, produced a rapid change in the
mind of the young convert, and he is related to have fallen into
an opposite extreme of conduct, and soon after, entering into
dislavours, finally to have enrolled himself as a painter of
paints. He returned to his native island at the age of twenty, when he became acquainted with a young creole lady, the Eleanor of his verse, which
acquaintance his fervent affection soon converted into the
most ardent attachment. Their mutual love inspired his first
poetical effusions, which paint with grace and freshness,
though perhaps in too vivid colours, the all-absorbing passion
of his soul. The affections however of the lady were of an
exquisite sweetness and a refined delicacy, which she intro-
ducted at the desire of her parents, induced Parny to return
to France. Distance and time were unable to efface his sad
reminiscences, and he there continued to translate into the
languages of poetry the feelings which appear to have taken
a lasting possession of his mind. In 1775 was published his
first collection of elegiac poems, which have been so much ad-
mired by his countrymen that they have earned for him the
title of the French Tibullus. On the breaking out of the
French Revolution he became deprived of the property which
he had inherited from his father, and he was compelled to ob-
tain a livelihood by the cultivation of his talents, and now
appears in many writings, which he had the weakness to adapt to the prevalent taste of a corrupt
tide. The rival of Tibullus became the feele copyist of
*Vesuvius, et les Bergeries de la Brie,* and *Guerre Des Dieux,* by their disgusting profaneness and
absence of genuine poetical feeling, will only be remembered
by posterity as indications of the state of society at a period
when everything evil was rank and luxurious. So strong
indeed was the feeling excited against Parny even in France
on account of the last mentioned of these three poems, that
his name was repeatedly passed over among the candidates for
the honours of the Institute. However he was admitted into
it in 1803, in the place of Devaines. Most of his other
poems are inferior to his early productions; his *Goddam,*
published in 1804, is a spiritless and insipid parody on the
invasion of England by the Normans; his *Isle de
Aglaia,* though possessed of more merit, is but a feeble
imitation of the Scandinavian style of poetry; but among his
later productions there are two small poems, one on the
culture of flowers, and the other entitled *Journal Champˆ
tre,* which for simple beauty and delicacy of colouring are
deserving of being ranked among the finest specimens of lyric
poetry. His principal poem, in eight cantos on the love of
Dece, was described by him from fear of its falling into the hands of the suspicious judges of the Revolu-
tionary Tribunal. He died in Paris, after a painful and
lingering illness in December, 1837.

His works have been published in 6 vols. 18mo. by Didot,
Paris, 1808, and at Brussels, in 2 vols. 8vo. The best
edition, however, is that by Mona Boissoneau in the *C
ollection de Classiques Francais,* Lefevre, Paris, 1827. A

volume was published in 1826 entitled *Le Poëtes inédi
fête,* with a notice on his life and writings by Mons. Tissot.

PAROCHIAL REGISTERS. [REGISTRATION OF
BISHOPS; S. P. C. 8.] [PARNABYUM; P. C. S.]

PARIS.

PARTNERSHIP. In 1857 a statute was passed (7 Wms. IV.
& Vict. c. 73) authorizing the crown, after a reference of an
application to the Board of Trade, to grant a species of incorpo-
ration to binding partners under the privy seal. The patent may limit the responsibility of partners to a
certain sum per share. The company obtaining such a privi-
lege must be constituted by deed of partnership, containing
its name, objects, the place where its business is to be
conducted, the names of the members, and the appointment of
two officers in whose name the company may sue and be sued.

These matters must also be entered, along with the additions
of the members and the shares held by each, in a numerical
order in a return which must be made within three months
after the date of the patent—in England or Ireland, to the
Enrollment Office of Chancery; in Scotland, to the General
Register House. Notice of the execution of the partnership
must be sent within three months. This registration is the criterion both of
benefits and responsibilities: no one is entitled to profits
unless as owner to registered shares, and no one is relieved
from responsibility until his name is entered in the regis-
ter. The extent to which this statute may have been adopted
in practice is not publicly known.

PASSABALDON, a genus of fossil Placoid fishes, from the
Bagash sand. (Buckland.)

PASSENGERS. [Smith, P. C. S.] MEYER, PHILIP.
ADAM, A distinguished painter, and author of one of the best collections of
biographies of Italian artists, was born at Rome about the year 1610 or
earlier. Passeri received a good education, and, according to his own account,
did not take up painting until comparatively late; he was first engaged in the
tapistry of a painter in 1656 by Canini in the Villa Aldobrandini at Frascati,
where he contracted an intimate friendship with Domenichino, then returning
from his travels in Italy. Canini was so well pleased with him that in 1641, Passeri was president of the Academy of St. Luke, and he read a funeral
oration on him, and painted a portrait of him, which was placed in the academy with other portraits
of painters, which are at present in the gallery degli Uffizi at Florence; the portraits now in the academy at Rome are
copies. (Platner, *Beschreibung der Stadt Rom.*) At the close of his life Passeri entered into holy orders; and in 1675 obtained a benefice in the college of Santa Maria in
Visa Letia. He died in 1679.

Passeri is one of the best of the Italian historians of art; his his-
thetic description was greatly admired, and was supposed to be very correct.
The circumstance of his book lying for nearly a century unnoticed, or rather unpublished, was owing to
its unfinished state and the severity of many of his remarks, especially those on the works of Domenichino.
He died in 1679, and his last five lives, as follow: Domenichino, Baccio
Ciarpi, Pieter Leur, called Bamboeck, Guido, Il Fiammingo, Agostino Tami,
Francesco Mocchi, Lanfranco, Camassei, Gabinista Can-
ziarda, Vinci, Alzamassa, Alessandro Turco, Pietro Testa,
A Caroselli, Aluardi, G. Rinaldi, G. Miele, M. Langhi,
G. U. Abatini, Luigi Gentile, Giovanni Finelli, Ag. Metelli,
Albani, M. Cervonzzi, Catterina Ginnali, Andrea Sacchi,
Romancelli, Gin. Freroni, N. Pousami, N. Baratte,
Gio. Ang. Canini, Guercino, F. Boromino, P. F. Mola,
Pietro da Cortona, e Salvador Ros.

There is a fine public picture by Passeri in Rome, a crucifixion between two saints, in the church of San Giovanni
della Malva. They are not so rare in galleries. He painted
sometimes still-life. His nephew Giuseppe Passeri was
likewise a pupil of his, and was not less esteemed. He

PASSANO/NO, DOMENICO DA, or DOMENICO CANARI, Cavaliere, was born at Florence about the middle of
the sixteenth century. Some accounts give 1560, but this is
probably too late; Begliosi says he was eighty years old.
when he died in 1658, which would place his birth in 1657 or 1658. He was the pupil of Federigo Zocchi, and lived some time in Venice, where he acquired a great preference for the Venetian school of painting, and especially the works of Paolo Veronese. He was then employed by the popes Paul V. and Urban VIII.; he painted the Crucifixion of St. Peter for the Capella Clementina in the great church of St. Peter on the Vatican, for which work he was paid 200 scudi. On the death of the painter Guercino, he spent the latter part of his life at Florence, and he was one of the most influential of those painters who contributed towards the reform of the Florentine school by improving the taste for landscape painting. His pictures of the Venetian school were popular. Passignano was the friend and associate of Cigoli, and is said to have been the master of Lodovico Carracci while in Florence. He died in 1658. He had many scholars, of whom Luca della Penna was the most distinguished.

(Baglione, Vite dei Pittori, &c.; Lanzi, Storia Pitztorica.)

PASTINACA (from pastinum, the Latin name for a two-pronged fork), a genus of plants belonging to the natural order Umbelliferae, and the tribe Pseudeceandria. It has a calyx with 5 very small or nearly obsolete teeth; round entire petals, involute, with an acute point. The fruit has a dilated flat margin. The carpels with slender ridges, 5 dorsal equilateral, two lateral distant, near the outer edge of the dilated margin. The interfascicles with single linear vitre.

P. sativa, Parsnip, has an angular furrowed stem, pilose leaves, downy beneath, ovate oblong, acute, crenate, serrate, often with a false petiole. The stem is 2 to 3 feet high. The flowers are yellow. The leaves generally shining above, sometimes downy beneath. It is native of Great Britain and America. It is found in the hill-locks, and on a chalky soil. The root is spindle-shaped, white, aromatic, mucilaginous, and has a sweet taste. A variety of this species, P. edulis, is the common edible parsnip, and is much cultivated in our gardens. For cultivation and uses of this variety see article Parsnip, P. C. Another variety, called P. Coquincis, has roots from three to four feet long, and upwards of six inches circumference. It is extensively used in the kitchen of Germany as fodder for cattle. In the north of Ireland parsnips are used in the composition of a kind of beer brewed with hops. Wine and spirits are likewise made from the roots.

P. Secale is another edible species of this genus, and is native of Syria and Egypt. It has a grey root, a terete downy branched stem, pilose downy leaves, pinnatifid cut leaflets, blunt and unequally toothed. It is cultivated in the Levant, under the name of Sekadul. The species are only to be increased by seed, which should be sown in the open border early in the spring.

(Don's Gardener's Dictionary; Babington's Manual of Herbs.)

PASTURE, COMMON OF. [COMMONS, P. C.]

PATELLOIDEA, a genus of molluscs proposed by MM. Quoy and Gaimard for certain Gastropoda, which have shells open below, similar to those of the genus Patella. The shells are cervico-branched. It is synonymous with the genus Lottia of J. E. Gray. The Patella testudinaria of Fabrictius, a shell not uncommon on the northern coasts of Britain, is the type. Numerous species are known, inhabiting all latitudes and living in various depths of water. Their shells are gaily coloured, often tessellated and rayed with purple, orange, or pink. The animals are usually of a uniform tint of white, orange, or pale red.

PATENT. The 7 & 8 Vict. c. 69, § 2, enables a patentee, by petition to the Queen in council, to obtain an extension of the patent term for any time not exceeding fourteen years. 'Some patents took their time at the expiration of seven years, is now granted under the powers of the said act of his late Majesty (5 & 6 Wm. IV. c. 83). This act of Victoria contains also a provision applicable to the patent acts of the time in force, that no new letters-patent which may have been granted under 5 & 6 Wm. IV. c. 83, to an assignee or assigns, and declares that such new letters-patent shall be as valid as if they had been made by virtue of the patent so granted; and not withstanding that this act contained shall give validity to any letters-patent hereafter granted to an assignee or assignees, when any action or proceeding in Scire faciunt or suit in equity shall have been commenced before the passing of this act, wherein the validity of such letters-patent shall have been or may be questioned.

PATENT. [PARTNERSHIP, P. C. S.]

PATERNITY, WILLIAM. Of the early history of this man, who originated several celebrated projects, little is known. By some accounts he is said to have been brought up to the clerical profession; by others he has been said to have migrated to the West Indies, and to have subsequently become a buccaneer. In the account however of the parish of Tinwald, Dumfries-shire, in the first volume of the statistical account of Scotland, it is stated that he was living there in 1718, and that his name is mentioned in that parish about the year 1660, that he was respectably connected, and that he more once sat for Dumfries-shire in the parliament of Scotland. Whatever may be his early history, he must have had ample opportunities for a self-acquainted with the commerce and institutions of foreign countries, and he was probably an extensive traveller. His schemes regarding banking and trading projects are said to have been first offered to the mercantile communities in the Low Countries, and to have been coldly received. He subsequently laid his plans before the merchants of London, and it seems to be nowhere doubted that they were the foundation of the project of the Bank of England, incorporated in 1694. [BANK, P. C.] From the rapidity with which the scheme was brought into a working shape, it may be conjectured that very little alteration was made on the original suggestions of Paterson. It does not appear clear that the inventor was for any length of time practically connected with the working of the institution. It is usually said that the rich capitalists, once possessed of his ideas, quarrelled with him, set him adrift, and drove a project which had the advantage of the public with active and enterprising spirits, who, by the two kingdoms being under one crown, had lost much of that department of foreign service which their ancestors had held in states at war with England. There was an earnest desire to rival England in commerce and manufactures, and in colonies, of which Scotland was not previously possessed. An act of the Scottish parliament was passed on 26th June, 1695, incorporating certain persons by name, with powers to add to their number, to be called 'The Company of Scotland trading to Africa and the Indies.' Very important privileges, both in connection with foreign trade and with the incentives to the commerce of the company, were granted to the members. The company raised a large subscription in England. Its progress roused the English jealousy of trade, and after some representations by the East India Company and other bodies of traders, a petition was presented to King William, in which they stated, 'that by reason of the superior advantages granted to the Scottish East India Company, and the duties imposed upon the Indian trade in England, a great part of the stock and shipping of this nation would be carried thither, by which means Scotland would be rendered a free port, and Europe from thence supplied with the products of the East much cheaper than through them, and thus a great article in the balance of foreign commerce would be lost to England, to the prejudice of the national navigation and the royal revenue.' In fact, under the guise of a company having a monopoly, Paterson's plan would have developed itself to the extent of establishing itself, as a nucleus of free trade; and its opponents rather felt how unable they would be to compete with this untrammelled community, than saw in its constitution any general principle of superiority to the restrictive measures put in force by the powers they were connected. 'We do hereby publish and declare,' says the first proclamation of the company, 'that all manner of persons, of what nation or people soever, are and shall be from henceforward to be excluded, equally as free men, from all said properties, privileges, protections, and immunities, and rights of government granted unto us; and the merchants and merchant-ships of all nations may freely come to and trade with us without restraint, proviso we do not take part in the manner of capture, confiscation, seizure, forfeiture, attachment, arrest, restraint, or prohibition, for or by reason of any embargo, breach of the peace, letter of marque, or reprisal,
declaration of war with any foreign prince, potentate, or state, or upon any other account or pretence whatsoever. And we hereby not only grant, concede, and declare a general and equal freedom of trade, navigation, and commerce to the commerce of all nations who shall hereafter be of or concerned with us, but also a full and free liberty of conscience in matters of religion.' In contemplation of a company carried on such principles as the English Parliament intended to establish, King William issued a proclamation to the effect that 'the privileges granted their company would render their country the general storehouse for tobacco, sugar, cotton, hides, and timber; the low rates at which the English manufacturers might be paid would enable them to undersell the English in the competition with them.' King William was induced to discountenance the undertaking, and the projectors were deprived of all aid, not only from England, but from foreign nations also. This was the more truly national object, and all the disposable wealth of Scotland was speedily embarked in it. The main scheme of the company was to establish a colony at Darien, when Paterson believed that it would be in the middle of the highway of the world, and form the emporium where the commerce of the East would meet that of the West. With all due respect for the principles on which the commerce was to be conducted, it may be questioned if the possession possessed all the peculiar advantages which it attributed to it, especially at a time when regular commercial enterprise had made so comparatively little progress. For this reason, on the 5th of July, 1698; its disastrous results may be found recorded in the ordinary histories of the period, and particularly in Sir John Dalrymple's Memoirs. Paterson was ambitious, but not mercenary. It may be said of him that he had reaped only of the profits which those confident of its success had assigned to him. The failure of the expedition preyed deeply on his spirits, and grief and disappointment brought him, during his return home, to the borders of lunacy. He lived subsequently a life of obscurity, and the period of his death is not recorded.

PATRIARCHS. We propose to give a chronological list of the Patriarchs of Alexandria, Antioch, Constantinople, and Jerusalem, arranged systematically with the Reformation Popes, for which reason we place the article under Roman Church.

PAVONA (in honour of Don Joseph Pavon, M.D., of Madrid, a traveller in Peru, and one of the authors of Flora Peruana). A genus of plants belonging to the natural order Malva. It has a 5-cleft persistent calyx, surrounded by an involucre from 5 to 15 leaves. The ovary has 5, and rarely 4, 1-ovuled cells. It has 10 stigmas, 5 carpels, capsular, 2-valved, and 1-seeded.

P. diuretica has coriaceous acuminate serrated leaves, velvety on both sides, and full of pellucid dots. The flowers are white, and sulphur-coloured. It is native of Brazil, in the province of Minas Geraes. A decoction of this plant is used in Brazil as a diuretic. This is the only species of Pavonia used in medicine; many others are however well known for their beauty of form and of colour. They are all free-growing plants, for the most part ripening seed in abundance, and cuttings will root freely under a hand-glass.

(Don's Gardner's Dictionary; Lindley's Flora British.)

PETICHETA (from the Latin word pediculus, a louse, from its supposed quality of making sheep that feed upon it lousy), a genus of plants belonging to the natural order Scrophulariaceae. It has an inflated 6-toothed calyx, a ringed corolla, with the upper lip laterally compressed, the lower lip 3 lobed. The capsules are acute, and compressed. The seeds numerous and angular. The species are usually simple herbs. The flowers sessile, disposed in dense terminal interrupted spikes.

P. pubescens has a solitary erect stem, branched throughout, pinnatifid leaves, with oblong blunt lobed segments; an ovate subobovate 2 lobed calyx, the lobes produced and decurved. The upper lip of the corolla has a short truncate base, with a triangular tooth on each side. The flower is large and crimson, varying to white. It is found in marshes and wet meadows, particularly in the north of England and is said to be injurious to cattle. This is the Pedicularis Nervosa of the North, and is called to the Pedicularis Herba of Columella. 6, 30, and of Scribonius Largus, P. syriaca has a stem branched at the base, erect, the branches long, spreading, and prostrate; the leaves pinnate, lobules ovate and deeply toothed. The upper lip of the

There are various cases in the reports in which the question of appropriation of payment has been discussed. (Bodleian and Purchas, 2 B and Ald. 29; Simpson and Ingham, 2 B. and Cr. 65; Pemberton and Oakes, 4 Russ. 154; and others.)

PEAR-GAGE. The principle of Smewon's pear-gage, for measuring the exhaustion of a receiver, differs from that of the other gages, in that the measurement does not take place until after the air has been re-admitted into the receiver. Suppose a wire working through a collar in the top of the receiver and supporting a tube open only at the lower end. Under the pressure of the air the tube will be forced into the receiver, so that by lowering the wire the open end of the tube may be immersed in the mercury. The exhaustion being made before lowering the wire, the air in the tube will be compressed, and if the wire be now raised, the tube being scattered into the receiver, the mercury will rise in the tube until the elastic force of the compressed air is the tube, together with the column of mercury and mercury balances the pressure of the external air. A gage attached to the tube shows, by the height of the mercury, what was the original rarefaction.

Now it is plain that while the ordinary gages show the actual amount of the rarefaction of the receiver, this pear-gage shows a much higher degree of true rarefaction than the ordinary gage.

For further detail see the article 'Pneumatics' in the Encyclopaedia Metropolitana.

PECOPTERIS, a genus of fossil Ferns, of which the species occur abundantly, both in the coal-measures and the colivic strata. (Bromiart.)

PECULIARS, COURT OF, is one of the English ecclesiastical courts of the Church of England. It is the third court of the archbishop of Canterbury, the other two being the Court of Arches, or supreme court of appeal, and the Prerogative or Testamentary Court. The Court of Peculiars takes cognizance of all matters relating to the various Peculiar churches of the Diocese of London, another in the diocese of Rochester, another in the diocese of Winchester, each comprising several parishes; and some others over which the archbishop exercises ex excommunication of members of bodies independent of the jurisdiction of the several bishops within whose dioceses they are locally situated.

(Political Dictionary, article 1 Ecclesiastical Courts.)

PEDICELLATUS, from the Latin word pediculus, a louse, which perhaps may be considered to be adopted by the English law, though the decisions are by no means uniform in this respect. (Note 20. Digest 46, q. 9.) The principles laid down apply to distinct debts on different accounts (cause). If there be dealings between two persons which are all of one uniform and continuance nature, as for instance between a banker and his customer, there is no
corolla as in the last species, the flower large and rose-coloured. It is found on wet, healthy, and rather hilly grounds in Sicily, Europe, and Great Britain. The expressed juice of the herb, or a decoction, has been used with advantage as an injection in scrofulous ulcers. It is injurious to the sheep that feed on it. There are 75 other species of Pedil- 
vulum in the world, each differing from the other in the habit to any useful purpose. They are found chiefly in Europe and Northern Asia. All these herbs are very shy of cultivation. Pest soil and a moist situation suit the generality of them. All require a pure, light, loamy soil to which sand or peat is added to this end they should be grown in pots. It has been affirmed that these plants breed like the animals that feed on them; the truth, however, appears to be that they indi- cate certain diseases in the body of an animal, warning the owner of an unhealthy state of the animal, and thus cause them to gene- rate vermin. (Don Gardner’s Dictionary; Babington’s Manual of British Botany.)

PEDRO, DON, Emperor of Brazil and King of Portugal, was the son of John VI., king of Portugal, and was born at the castle of Sesimbra on the 12th Oct., 1767. When young he was the active witness of the long series of political troubles which distracted Portugal, and which are fully de- tailed in another part of this work. (Portugal, P. C.) At the age of 18, in 1785, he was sent in a letter of audience to Queen Maria Isabella, in their exile to Brazil. The misfortunes which had befallen his family proved an advantageous school for his political education; they became the means of deve- loping in him the firmness, the sagacity, and the cunning necessity of depending on other sources than those which should arise from his own talents and energy. He applied himself with considerable success to the acquisition of various languages, while he devoted the hours usually spent in recreation to the cultivation of poetry and music.

At the general peace of 1815 a marriage was contracted for the young prince of Brazil, the title by which he was then known, with Maria Leopoldina of Austria. At that period the colony of Brazil was raised to the rank of a kingdom, and, when, in 1820, John VI. was recalled to Portugal by the Cortes, Don Pedro remained as regent in that country. (Brazil, P. C.) His first position in political life was, as will be seen by reference to the article Brazil, P. C., one of peculiar difficulty; to preserve the authority with which he had been intrusted, and to secure the peace and prosperity of the kingdom, required the exercise of diplomatic skill, and a firm resolution of no ordinary kind. The Cortes of Portugal were desirous of reducing Brazil to its ancient position as a colony, and to confine its commerce to the mother country; they also designed for it a new system of government by dividing it into provincial administrations. The prince regent, sensible of the impolicy and injustice of this scheme, placed himself at the head of the movement against it, and refused obedience to the attempted innovations. The Portuguese troops stationed at Pernambuco and Rio Janeiro were sent back to Europe, and, on the other hand, the Portuguese commander in Bahia, the maintained possession of that town, and expelled it from the militia. Civil war was the necessary consequence of these proceedings, and on the 13th of May Don Pedro was proclaimed protector and perpetual de- 


feudor of Brazil; and, finally, on the repeated refusal of the Portuguese Cortes to abandon their design, the independence of Brazil was declared; and the prince, yielding to the popular wish, was proclaimed emperor on the 12th of October, 1822, and was crowned on the 1st of December in the same year. The details of the war which followed with Portugal, the constitution which was adopted by the Brazilians, and sanc- 

tions by the emperor, will be found elsewhere. (Brazil, P. C.)

Though Don Pedro appears to have satisfied the exigencies of the new state by granting it a constitution based upon liberal principles, it did not secure the government continued to manifest themselves. The long anarchy which had existed in the provinces rendered the inhabitants indisposed to submit to regular rule, and the instinctive hatred of the Brazilians towards the Portuguese diminished the popu-


larly of the ruler. Insurrections broke out at Pernambuco, San Salvador, and Bahia, which were however speedily checked. In 1825 the independence of Brazil was recogn- 


ised by the powers, and the government continued to be in a state of social and political depression. The empire split up between Brazil and the neighbouring republic of Buenos Ayres (Plata, La, P. C.) respecting the possession of a territory named the Banda Oriental, the inhabitants of which were desirous of annexing themselves to the new empire, and a war ensued, which terminated unfavourably to the interests of Brazil. To this cause of discontent another was added by the death of John VI. in March, 1826, and the consequent succession of Don Pedro to the crown of Portugal. This event excited the jealousy and animosity of the Brazilians, and to this end they should be grown in pots. It has been affirmed that these plants breed like the animals that feed on them; the truth, however, appears to be that they indi- cate certain diseases in the body of an animal, warning the owner of an unhealthy state of the animal, and thus cause them to gene- rate vermin. (Don Gardner’s Dictionary; Babington’s Manual of British Botany.)

The throne of Portugal, which Don Pedro had resigned in favour of Donna Maria, had been usurped by his brother Don Miguel, whom he had absolved and reinstated in his domin- 


om. (Portugal, P. C.) His object was now to recover the country from the usurper, and to reinstate his daughter in the rights of which she has been deprived. The plan of the enterprise was managed by the secret advice of the king himself, who was joined by the exiled Portuguese who had espoused his cause, at the head of whom was General Saldanha, and a great number of foreign adventurers. For the details of the civil war which ensued we must again refer to another part of the Cyclopedia. (Portugal, P. C.) On the 26th of May, 1832, Don Miguel was reduced to the neces- 


sity of signing a convention, which left the young queen in quiet possession of the throne of Portugal under the regency of Don Pedro.

The acts of his short administration were calculated to secure for him the good will of the more liberal party in his dominions; but many of them, though they might have been expedient, were certainly unjust. He strengthened the ex- 


ternal relations of Portugal by a close alliance with England and France, and in order to give an interest to the people in the new revolution he conferred for the use of the state the property of the numerous monastic establishments in his king- 


dom. The anathemas of the Vatican were the natural result of these sweeping measures, and they were soon followed by his own excommunication. In September, 1832, the de- 


clinating state of his health compelled him to resign the regency, and his daughter, having been declared of age, was placed in full possession of the royal authority. He did not live to see the consummation of his plans, and the palace where he had been born was the scene of his death on the 24th of September, 1834.

The life of Don Pedro is chiefly interesting as it is con- 


nected with the history of the period; the difficult circumstances in which he was placed deprived him of the opportunity of putting into effect many measures of utility which he had the talent to design, and on a more quiet theatre he might have acted the part of a greater king.

PEEL (or PEELE, as the name is found in most books printed forty years ago), Sir ROBERT, the first baronet, was born 26th April, 1750, at Peel’s Cross, near Lancaster, a small property belonging to his father, Mr. Robert Peel, whose third son he was. The family, though not wealthy, appears to have been of some respectability for several gener- 


ations. It is said to have been late in the thirteenth century, and died in 1376. His son is described as William Peel of Oswaltwich, who married Jane, daughter of Lawrence Walmesley, of Darwin, Esquire; their son, Robert, of Peel’s Cross, married in 1750, Jane daughter of Henry, son of John, of Backburn, Gentleman, and had a numerous family of sons.

It is understood that the Peels had been Unitarians for some generations, and that Sir Robert was brought up in that tenet. When he became a lawyer, he was early made to serve the court, but he early gave evidence both of remarkable business talents, and of a decided ambition and determination to raise himself
in the world. He and most of his brothers were brought up
to different branches of the cotton-trade, now fast extending
under the effect of the inventions of Arkwright, whose per-
sonal success in the acquisition of wealth and station was
also fast extending, operating as a powerful example and incentive.
The merchant principles of the trade have also engaged much
of Peel's attention, though they were never indebted to him for
any improvement, so far as we are aware. He aided his fortune by his general ingenuity and sagacity,
by his unremittent activity in the management of his comprehen-
sive boldness of enterprise, and by his admirable conduct of
business, alike in its largest scope and in its minutest details.
In 1767, Robert Peel entered into partnership with
Mr. William Yates in an extensive factory at Bury, in Lancas-
tashire; and on the 8th of July, 1783, he married Ellen,
daughter of Mr. Yates, who had then just completed her
seventeenth year. His career from this time was one of
great and uninterrupted prosperity. About the time of
his marriage he purchased a considerable estate in Lancashire;
and in the course of a few years he invested large additional
sums of money in land in the counties of Stafford and War-
wick. It has been asserted that Mr. Peel's principles were originally
favourable to the French Revolution, or at least to the
class of opinion in which he had been brought up; but that
we apprehend, must be a mistake. He appears to have first
come forward as a politician in 1780 by the publication of a
pamphlet entitled 'The National Debt productive of National
Prosperity, which may be taken as evidence that his views at
that date were the very reverse of revolutionary or dis-
affected. In 1790 he was returned to parliament as one of
the members for Tamworth, in which he served with
such a spirit that it is not improbable that from that moment he entered the House of Commons, in which he
sat for the same borough in seven successive parliaments,
or to the end of the reign of George III., he was a steady
and zealous supporter of the government. We do not see,
therefore, to what period of his life we can with any proba-
ability assign his imputed republicanism. In 1799 Messrs.
Peel and Yates distinguished themselves
by their subscription to the Loan of 1798, to which we
called the Loyalty Loan. This fact is often stated in such a
way as to make it appear that the money was a munificent
gift which they made to the public. The truth is, it was
merely a purchase of so much stock in the Public Funds,
which promised and proved to be an excellent speculation,
and was evidence of nothing except the confidence of the
subscribers in the stability of the government, and their
correct views of their own interest. The entire loan, amount-
ing to 18,000,000L, was raised in a few hours, and might
probably have been doubled in amount if it had been desired
for the purpose of satisfying a mob of applicants whose
subscriptions could not be received. 750,000L was subscribed
by Messrs. Peel and Yates was far from being the highest;
the Duke of Bridgewater, for instance, subscribed 100,000.
For the Literary Fund, a sub-committee of which included
him, bearing an interest of five per cent., with a right to have
their stock two years after the conclusion of a peace converted
into three per cent. at the rate of 150L. 6s. 8d. for 100L.
capital.
In 1798 Mr. Peel further showed his loyalty and public
spirit by the part which he took in encouraging the volunteer
system. Besides assisting in the formation of the Lancashire
Pencillers, and the Tamworth Armed Association, he raised,
chiefly from among his own workmen, six companies of
which were called the Bury Loyal Volunteers, and got himself
commissioned as their lieutenant-colonel. On the 14th of
February, 1799, he was a signatory in favour of the Union with Ireland, which was soon after
printed and extensively circulated in that country. On the
24th of November, 1800, he was created a baronet.
Sir Robert Peel, the number of persons employed by whom
is said to have amounted in 1803 to fifteen thousand,
and lived for ten years after his retirement from parliament
in 1820, dying at his seat of Drayton Park, in Staffordshire,
the 14th of April. On the 13th of April, 1787, he had married a second wife, Susannah, sister of the Rev.
Sir William Henry Clarke, Bart., Rector of the parish of Bury,
then then in his fifty-third year, and who died on the
10th of September, 1824. By his second marriage he had six sons, one daughter, and five daughters;
the eldest of the former being the present Right Hon. Sir
Robert Peel. It may be remarked that, with the exception
of two daughters who died in infancy, he saw all his children
married before his death. Besides his large landed property,
which he entailed upon his eldest son, together with, it is
supposed, near half a million in money, he left about 150,000L.
to each of his younger sons, and above 50,000L. to each of his
daughters. Sir Robert Peel bequeathed 100,000L to his younger
brother upon his several children above 240,000L, besides an income
of 9000L, per annum secured to his eldest son.

PEELE, GEORGE, is supposed to have been a native
of Devonshire, and to have been born not later than 1552 or
1553, and educated in St. John's College, Cambridge, and
Pembroke College, in Oxford: he took his degree of Bachelor
of Arts in 1577, and was made Master of Arts in 1579.
In no time long afterwards he appears to have removed to Lon-
don, and thrown himself upon the world as a literary adven-
turer. In that age the preciosity always incident to the
profession of authorship was so distressingly great, that,
if pursued on by a poor man, was barely compatible
with the preservation of personal respectability; and, though
the particulars of Peele's career are but very imperfectly
known, there is evidence enough to show that it was not only
unfortunate but disreputable. His conduct is represented as
being a continual and habitual one of that which of which
Greene, who were his intimate associates and his coadjutors in
the improvement of the early English drama. It had been
conjectured that he was professionally an actor, and his hav-
ing been a player in 'The Spanish Friar' is at least not
impossible, as it was acted by Mr. Collier. A tract, frequently reprinted, entitled 'The Merrie Conceited Jestes of George Peele,' represents him as
nothing short of a common swindler. Some of the exploits
of the author of 'The Spanish Friar' are quite as absurd as
the rest of his plays, and though Mr. Collier lamented that he
had not been able to ascertain historical facts which appear
under poverty and sickness, he addressed to Lord Burleigh;
and it is a characteristic trait of the man, that, relying peri-
haps on the Lord Treasurer's ignorance of the current litera-
cure, he took care to make no claims to any authorship
in plays which were known to be the work of others. He is
not improbable that he wished to be regarded as new, he had
actually published six years before. He was dead in 1598,
when Meres, in the second part of his 'Falladis Tama," des-
pcribed his death as having been caused by his debaucheries.
In the 'Jestes' he is spoken of as a married man; and his letter
to Lord Burleigh describes the bearer as his eldest daughter.
The earliest of Peele's compositions that is known is a copy
of verses prefixed to Watson's 'A Henrikale,' which was
published in 1581; and his earliest known drama was printed in
1584. In 1588 Mr. Dyce published an excellent edition
of 'The Spanish Friar.' George Peele, with the other Life and Writings,' 2 vols. post 8vo. A reprint of this edition
with improvements and additions, appeared in 1829; and in
1589 the same editor published a third volume, which proba-
ably contains the only complete reprint of this play. A new
impression is possible to render it. The non-dramatic poems, except a few
short miscellaneous pieces and a long piece on the War of
Troy, are speeches for pagetaps (such as 'The Device of the Paget borns before Woolstone Dixie, Lord Mayor of
London, 1665,' or celebrations of public occasions, like the
'Polybvinia,' which describes a tilting-match held in the
queen's presence in 1589, and 'The Honour of the Garter
displayed,' which commemorates the installation of the unfortu-
unate Earl of Northumberland in 1593. The dramas in Mr.
Dyce's collection are six in number:—1. 'The Arraignement
of Paris,' published anonymously in 1584, and assigned to
Peele on the 'House of Commons,' and 'Chronicle of King Edward the First,' printed in 1599 and 1599,
and inserted in vol. xi. of the last edition of 'Dodgley's
Old Plays,' as also in vol. iv. of the small collection called
'The Old English Dramatic Poets.'. 2. 'The House of
Wives,' a pleasant conedect Comedie,' printed in 1595,
and chiefly remarkable as treating, in a coarse and prossic
fashion, a story closely resembling that of Milton's 'Comus.'
He had written 'The House of Wives,' which was published
in 1615, under the title of 'The Tragedy of Abelson,' printed in 1669, and reprinted in
the second volume of Hawkins's 'Origin of the English Drama,'
1775; 5. 'The Battle of Alsace,' printed in 1594; 6. 'The
Famous Historie of Marmion's Captivity,' and 'The
Claymidey,' printed in 1599, with no author's name, but attributed
to Peele by Mr. Dyce, on the faith of a MS. marking in a
very old hand on the title-page of a copy, to which not a little
corroboration is afforded by the play itself. Thomas Campbell, in his 'Specimens,' has spoken of Pocel more favourably than any other critic. There is more of justice in the cool estimate of his merits formed by Mr. Dyce and others. 'Those of his works which are not of the English drama,' says Combe Knight, 'afford evidence that he possessed great flexibility and rhetorical power, without much invention, with very little discrimination of character, and with that tendency to extravagance in the use of his imagination which exhibits small acquaintance with the higher principles of the dramatic art.' His inferiority to Marlowe is great and unquestioned; and perhaps it is only his musical though monotonous versification which claims the distinction of an imitation of the Greek drama.

PELLERIN, JOSEPH, was born at Marli-le-Roi, near Versailles, April 27, 1684. He studied at Paris, and, besides the Latin and Greek languages, made himself master of the Italian, Spanish, and English. After completing his college studies, he learned Hebrew, Syriac, and Arabic. His knowledge of the three modern languages procured him, in 1706, a situation in the navy-office (bureau de la marine), where he was employed in making translations and extracts in those languages from the foreign correspondence of the minister.

Several letters written in cipher having been seized on board a Spanish frigate on her voyage from Barcelona to Genoa, in 1707, Pellerin in a few days deciphered them without the keys. They were found to be important communications, some in French for the court of Turin, and some in Italian for the court of Naples. Torey, then minister for foreign affairs, having recommended Pellerin, soon afterwards appointed him secretaries private (secretaire de cabinet) to the secretary of state for the navy; and he held the situation when, on the death of Louis XIV., the business of the office was in the hands of the queen. In the meantime, the greater part of the French admirals, particularly de Briguez, had been appointed by Pellerin a commissioner of the navy (commisariat de la marine) in 1718, and sent him on service to the great harbours of France, and in 1719 he was destined to make a general visit to all the harbours of the kingdom, at the expense of ministry took place, the council of the navy was suppressed, and other measures were decided on. Pellerin however still continued attached to the department of the minister for foreign affairs, and was made secretaire general, and afterwards was made first clerk of the navy (premier commis de la marine), in which office his activity, probity, and firmness, combined with the anxiety of his manner, met with universal approbation. In 1745 bodily infirmities compelled him to retire from the public service. His son, who had served in the navy and in the naval department of the government, succeeded him in his office.

Pellerin, during his long service of about forty years, had used the opportunities which his situations afforded him in the collection of a considerable number of coins and medals, at first from French sources and afterwards from abroad as material for the formation of a cabinet of antiquities. To occupy his leisure and alleviate his sufferings, after his retirement, he began to read, explain, classify, and arrange them. His early studies in the oriental languages, as well as in his mother tongue, were made use of by him as a source of much gratification to him. Such was the origin of that magnificent collection of coins and medals which he formed in the course of the subsequent forty years of his life. He died at Paris, August 30, 1782, in his ninety-ninth year.

In the arrangement and classification of his medals Pellerin adopted a system different from that of any previous collector. Instead of distributing them in drawers according to difference of metals, and arranging them alphabetically without reference to the countries to which they belonged, he placed them according to certain geographical divisions, preserving however an alphabetical arrangement of the medals of each country, each medal being placed in the division of its country. His descriptions of the medals, with his comments and remarks, formed a large Catalogue raisonné, which he published under the title of 'Recueils de Médailles de Poiret, des Mémoires de Pellerin, de la Bibliothèque de M. de Vitry, et de la Bibliothèque de M. de la Fontaine,' and which, from its publication in 1791 to 1798, its delightful in flavour of the period, and his system of arrangement and classification similar to that of Pellerin was adopted by Eckhel, in his 'Doctrina Numorum VETERUM.' [Eckhel, F. C.] Pellerin and Eckhel were both very industrious in this division; Eckhel writing in 1770 a collection, which consisted of 39,500 medals, was bought by the King of France, in 1776, for 300,000 francs. The king afterwards allowed Pellerin, as long as he lived, the use of the whole of the royal collection, which then amounted to about 44,000. The most important additions which have since been made to numismatics relate to the coins of the kings of Bactria. [Prisse, JAMES, P. C.; ANGRISTAN, P. C. S.]

PELLISSON-FONTANIER, PAUL, was born at Béziers in 1624. He was deprived of his father at an early age, and was educated by his mother in the principles of the Reformed church. He became an advocate, took his degree in law, and in the profession of the law, and to that profession he was also destined. He studied successively at Castres, Montauban, and Toulouse, and acquired an intimate knowledge of the best classical authors, of the Institutes of Puffendorf, and of the Green's nature. To the study of civil law and jurisprudence he especially devoted himself; the fruits of which shortly afterwards appeared in a paraphrase of the Institutes of Justinian, which was published at Paris in 1645. He commenced his legal career with considerable success at Castres, but it was soon interrupted by a most severe attack of small-pox, which permanently affected his sight and so disfigured him that Mad. de Scodleri, though sincerely attached to him (Mesangiene, vol. ii. p. 381, Paris, 1715), could not refrain from making him the object of her wit, by remarking that he abused the permission of being ugly.

Compelled by infirmities to abandon the practice of his profession, he retired into the country and devoted himself to general literature. In 1652 he settled at Paris, where his writings had already made him advantageously known. The French Academy had elected him an associate, and the Académie des Sciences and des Arts had rewarded him by writing its history (the work perhaps by which he is best known), decreed that he should be appointed a member of it on the first vacancy that should occur, and that he should be elected a member of the Academy of Inscrip- tions; to enhance the honour, they further decided that a similar privilege should be on no consideration be granted in future to any man of letters. The same year Pellisson pur- chased the office of secretary to the Academy, an appointment which he applied to the performance of his duties acquired for him a reputation for the management of public affairs. In 1657 he was appointed first clerk to the Intendant of finances, and in the same year, by the influence of the minister where vast sums of money passed through his hands he maintained his reputation for integrity, while his increased means enabled him to render pecuniary services to the dis- tressed men of letters in the capital. Several traits of his generosity are recorded and their value is increased by the delicate concealment which accompanied them. (Ménagier, vol. ii. p. 16.) His services were rewarded by Fouquet with the appointment, in 1660, to the office of state censor. The following year he partook of the disgrace of his patron, and, as being the principal sharer in his fortunes and the supposed confidant of his secrets, was imprisoned at the Bastille, where, unaccustomed up to that time to captivity, and constantly resisted every attempt which was made to induce him to divulge anything prejudicial to the interests of his benefactor. During this imprisonment he composed the 'Mémoires,' in behalf of which he has been reckoned the finest models of that species of writing in the French language; the author of the 'Lettres de Louis XIV.' considers them the nearest approach to the Ciceronian style that French literature possesses; they are indeed alike honourable to his talents as a writer and his feelings as a friend. They became however the plea for additional severity towards Pellisson. In order to increase the rigor of his confinement he was deprived of the use of ink and paper, the want of which compelled him to have recourse to divers ingenious expedients, such as writing on the margin of his books, or on the leaf margins of printed books which he had brought with him, or making use of the system of arrangement and classification similar to that of Pellerin was adopted by Eckhel, in his 'Doctrina Numorum VETERUM.' [Eckhel, F. C.] Pellerin and Eckhel were both very industrious in this division; Eckhel writing in 1770 a collection, which consisted of 39,500 medals, was bought by the King of France, in 1776, for 300,000 francs. The king afterwards allowed Pellerin, as long as he lived, the use of the
rable value in the diocese of Auch. However, he is favour-
yably distinguished from most prolesytes by the lenient and
tolerant disposition which he evinced towards those who dis-
agreed with him; in public, he publically disapproved and opposed by his influence
and writings the violent measures which were employed by the
king's command [N v esti, P. C.] to bring his Protestant
subjects from the French royal domain. In 1571, when the
occasion of the reception of the archbishop of Paris as
member of the Academy, he delivered a panegyric on Louis
XIV., which was translated into the Latin, English, Spanish,
French, and even into the Arabic language. In 1563, having
incurred the displeasure of Madame de Montespan,
he was deprived of his office of royal historiographer, but,
at the special request of Louis, he continued to write the Life
of the King, and for that purpose accompanied him in several
of his campaigns. Nearly every succeeding year of Pellisson's
life was marked by some instance of royal favour. His death
took place at Versailles, in February, 1693. The fact of his
not receiving the Sacrament in his last moments has been
explained by the Roman Catholic writers to be owing to the
suddenness of his death, by Protestants to his unwillingness
to sanction a conversion, which they allege to be insincere,
yet a solemn act of hypocrisy. The arguments on both sides will
be found impartially stated by Bayle (art. Pellisson).

The principal works of this writer, who enjoyed a greater
reputation in his life-time than has been accorded to him since,
his Histories de France, which was first published at Paris, in 1658; the best edition is
that by l'Abbé d'Olivet, by whom it has been continued.
Paris, 1730. The fault of this work is generally considered
to be the conventional style which Bishop Sprat, in his 'Hist.
of the Royal Society of London' (part 1., sect. 19), 2, 'Histoire de Louis XIV.', which ex-
tends from the death of Mazarin, in 1661, to the peace of
Nimegum in 1678; this histo, has the faults to be expected
in the work of a professed courtier; the best edition is that
of Paris, 3 vols. in 12mo., 1749. 3, 'Abrégé de la Vie d'Anne
d'Autriche,' 1696, in 4to; a panegyric rather than a history.
4, 'Histoire de la Conquète de la Franche Comté,' 3 vols.
of 'Les Mémoires du Père Desmolet,' this work has been
greatly praised by Voltaire. 5, 'Histoire des Guerres et
Ouvrages divers,' 3 vols. in 12mo., 1749; the letters, 275
in number, are a journal of the king's journeys and encampments
in the above-mentioned campaign. 6, 'Recueil des Pucres
Galantes,' 5 vols., 1685, being a correspondence in prose and
verse between him and the Contesse de la Suse; his verse
parbutes of the elegance of his style in prose, but it is deficient
in imagination. 7, 'Réflexions sur les Différend de la
Religion,' 4 vols. 12mo., an answer to the arguments of Jules
Rousseau; on this occasion, Bayle has many
several valuable remarks in his notes on the article 'Pellisson.'
8, 'Traité de l'Escharite,' a work he left unfinished.
The Prologue in verse of the comedy 'Les Facheux' of Molière
is from Bayle's translation of a comedy of the same name 'Le
Menippe,' vol. ii., 1689, 207, 331; vol. iii. p. 131.)

PENSTOCK, a kind of small sluice or floodgate,
employed to retain or let go at pleasure the water of a mill or
other pond. A cut of a simple form of postern sluice is
given under IRIGATION, P. C. See also Sluice,
P. C., p. 142.

PENTZ, PENCZ, or PENZ, GEORG, a celebrated
German musician and composer, was born at Nürnberg
in 1590. He was first pupil of Albrecht Dürer, and he
afterwards studied the works of Raphael at Rome, probably
after the death of Raphael, but before his school was dispersed
in 1520. Most of his works are correct in design of the early
German masters, perhaps most the correct. His prints are
numerous, but his pictures are scarce; there are some at
Nürnberg, and a few in the galleries of the Grand-duke of
Schlesien. Barthz enumerates and describes 126 engrav-
ings by Pents, of which the best are seven of the history of
Tobias. He was the pupil of Marcantonio, and assisted
him in some of his prints after Raphael. (Saudart. Deutsche Academie, &c.; Doppelmayr, Histo-
rasche Nachricht von den Niederländischen Künstlern, &c.
Bartsh, Peintre-Gравeur.)

PEPPER-CORN RENT. [Rawr, P. C.] A kind of tax is a walking through or over ground for the purpose of settling boundaries.

A perambulation of a forest is a walking over the boundaries of a forest by justices or others to fix and preserve its bounds.

A perambulation of a manor is a walking over the boundaries of the manor by wardens, and parishioners once a year, or in Ascension-
week, for the purpose of preserving the boundaries. Usage will justly the parishioners in following the boundary over the lands; but in many cases, by force of custom, have been
ambulated: and there is a writ De Perambulation Facenda, which ought to be sued with the assent of both parties when
they are in doubt about the bounds of their lordships or
manors. The writ is addressed to the sheriff, who is to
examine it and make his return to the justices at Westminster
on a certain day; or to the justices of assize, under his seal and
the seals of those who make the perambulation with him. The
king may direct the writ to other persons to make the per-
ambulation, as well as to the sheriff. This perambulation made
by assent binds the parties and their heirs. But unless both
parties who assent to the perambulation are tenants in fee-
simple, it seems that the perambulation shall not bind him
who is in reversion.

Questions of boundaries are now generally determined by
actions of trespass or ejectment.

It began at the time of the Terminalias, in the month of February, to perambulate the boundaries of a
district or community. The old original boundaries of the
territory of Rome, which extended six miles from the city,
were preserved; and the tenements of the Commune,
private properties were also perambulated at the Terminalias,
and the usual religious offerings were made. This ancient
and simple mode of preserving boundaries probably fell into
disuse as late as the more modern age, and the
records of boundaries were better kept. It is stated that
the practice fell into disuse with the establishment of Christianity.
But this is not probable. The religious ceremonies might be
changed or dropped; but the custom of perambulating being still
kept up in this country in the case of parishes, leads to the
conjecture that the practice extended from Rome to other
countries which the Romans occupied or retained in
some form among the Christianized peoples in the
provinces. (Fitz-Herbert, The New Natura Brevium, p. 296; Rudorff,
in the Zeitschrift für Geschicht. Rechtsste. x. 486.)

PERCIER, CHARLES, a charlatan of celebrity, whose
name is so intimately associated with that of his friend
and professional colleague, Pierre Louis François Fontaine, that
the reputation of the one is inseparable from that of the other,
for both were imprisoned. Bayle has made several
inductions of their joint talent. Percier, whose father was
a colonel of dragons, was born at Paris, August 22, 1764;
and had for his first instructor in art one Pouisson, who
was no doubt the father of a nephew, who was master of
the school of Peyre, and afterwards studied under the elder
Gisors, another architect of considerable repute; and having
obtained the prize for a project for a Jardin des Plantes, in
1786, he went to Rome, where he was at once quite over-
whelmed and perplexed by the multiplicity of buildings and
other objects of art that at all once solicited his study. It
was at Rome that his friendship and connexion with Fontaine
commenced, and there he also became acquainted with Flax-
man, Canova, and other artists, who afterwards rose to emi-
nence. During their residence in that city, Percier and
Fontaine made the drawings which form the subjects of their
first publication, viz. 'Palais Montmorency, et autres
Edifices modernes, desainés à Rome,' Paris, 1798, a folio with 100
plates, beautifully delineated and engraved in outline. In
the interim, and for a while after their return, they had to
contend with the banishment of their Perambulation Facenda
in 1740; after which they published angaged
agitated state of public affairs was most unpropitious to their
profession, more especially to beginners in it; they were therefore
obliged to provide for their own act of existence by
making designs for various articles of ornamental manufacture
and furniture. The careful study and superior taste displayed
by them, rescued them from the obscurity to which they
would have been consigned had they been left to the
impartial judgment of the public before the public. Various decorations, executed by them
at Malmaison for the First Consul and Madame Bonaparte,
secured for them the powerful patronage of the Emperor
Napoleon, who, on the most immediate occasions of his
reign they were employed to restore, and

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embellish the two palaces of the Tuileries and the Louvre, of which latter more especially the very extensive, numerous, and complicated works fully occupied them for a series of years; a notion of the magnificence of the Bourbon. This accounts for their having, with all their high reputation, been employed on so few buildings; and flattering and favourable as it was, it was not wholly without drawback, because their patrons, the last subject with respect to their own architectural creations, and their fame in them merged in the renown of their original authors. One distinct work of theirs is the arch (1806) in the Place de Carrousel, before the court of which stood the mounted statue of the latter case and other separate portions of the interior of the Louvre. The chief other monument by them is the Chapelle Expiatoire erected after the Restoration, in memory of Louis XVI. The list of their works is large; but Perout adds nothing to their professional fame, it being no more than a handsome and regular piece of street architecture.

For the general celebrity attached to their names, Percier and his colleague are perhaps, after all, mainly indebted to their publications, and not least of all to that entitled 1 Recueil de Decorations Interieures, contenant tout ou qui a rapport a l’Aménagement, folio, Paris, 1812, a collection of designs for rooms and various articles of furniture in the ultra-classic style of embellishment that was affected in France at the beginning of the century, but which was so entirely matters of mere fashion, that Percier lived to see it pass away. Another publisher, who was to gather great profit, was the "Choix des plus belles Maisons de Plaisance de Rome et ses Environs," a series not of strictly architectural studies, but pictorial views of Roman villas and their gardens. To these may be added the publication of the table given to the public of the ceremonies and pomps at Napoleon’s coronation; the other, those which took place on his marriage with Marie Louise. Besides these, there is another work attributed to Percier, which does not appear to have got into general circulation, 2 Parallèle entre plusieurs Residences de Souverains de France, d’Allemagne, de Suède, de Russie, et d’Italie, Paris, 1833, with thirty-eight plates. Percier died at Paris in 1838. 

PERCEBE. (or Percebi), a family of Acanthopterygious osseous fishes, of which the perch is the type. The Percebeae have bodies covered with rough scales, ciliated at the margin. The edge of the opercle or preopercle is dentilated or spiny. The vomer, also jaws, and usually the palatine bones, are armed with teeth. Perca, Trachinus, and Mugilus are British genera of this family. Bergas is an inter-tropical percoid genus, containing two or three species remarkable for bright-red colours, tinged with golden hues. Holocentrum is an allied genus, including very beautiful fishes, mostly tropical species. Myripristis diversicolor, Holocentrum inermis, and Trachichthys are all in different lenticular spines. Trachichthys is also a genus of this family.

PERIDINM, a genus of infusorial fossils, which occurs in the Eocene beds. (Peridinium.)

PERICHEIROCRUS, a genus of fossil Crinoid echinodermata, found in the Silurian strata. (Austria.)

PERIODUS, a fossil fish from Steepy. (Agassiz.)

PERCY, JOHN, was born in Aberdeen on the 30th of October, 1766. He received the rudiments of his education at the rural parish school of Chapel of Garioch, studied Latin at the grammar-school of Aberdeen, and in the year 1777 was entered a student of Marischal College. He seems to have been destined for the profession of the law, and was for some time employed in the office of one of the attorneys, or, as they are by local usage termed, advocates, of Aberdeen. There are some traditions of his being an inefficient clerk, and having stolen so much time from the unscientific details of the country practitioner’s office, to be devoted to higher studies, that his master losing all patience deserted his pupil, and young Percy, intent on the prospect of becoming a prosperous country attorney. Perry was master of that ordinary Scottish education which fits his owner for many of the progressive and less-established departments of business, but leaves him in the most disadvantageous position, where he in vain attempted to procure the means of livelihood. He went afterwards to Manchester, and was rather more fortunate, obtaining employment as clerk to a manufacturer. He had had an eccentric education, and was more of an invigorating his mind, and fitting himself for those higher walks of industry in which he felt an innate capacity to occupy. He had shown intelligence and ability as a member of a debating society in Manchester, and went thence in 1771 with introductions to people of some influence in London. Among the friends who had made him general promises of assistance in procuring a situation was Mr. Urquhart the bookseller. Percy had written an essay in 1770 in the most inflammatory style of the Bourbon. This accounts for their having, with all their high reputation, been employed on so few buildings; and flattering and favourable as it was, it was not wholly without drawback, because their patrons, the last subject with respect to their own architectural creations, and their fame in them merged in the renown of their original authors. One distinct work of theirs is the arch (1806) in the Place de Carrousel, before the court of which stood the mounted statue of the latter case and other separate portions of the interior of the Louvre. The chief other monument by them is the Chapelle Expiatoire erected after the Restoration, in memory of Louis XVI. The list of their works is large; but Perout adds nothing to their professional fame, it being no more than a handsome and regular piece of street architecture.

For the general celebrity attached to their names, Percier and his colleague are perhaps, after all, mainly indebted to their publications, and not least of all to that entitled 1 Recueil de Decorations Interieures, contenant tout ou qui a rapport a l’Aménagement, folio, Paris, 1812, a collection of designs for rooms and various articles of furniture in the ultra-classic style of embellishment that was affected in France at the beginning of the century, but which was so entirely matters of mere fashion, that Percier lived to see it pass away. Another publisher, who was to gather great profit, was the "Choix des plus belles Maisons de Plaisance de Rome et ses Environs," a series not of strictly architectural studies, but pictorial views of Roman villas and their gardens. To these may be added the publication of the table given to the public of the ceremonies and pomps at Napoleon’s coronation; the other, those which took place on his marriage with Marie Louise. Besides these, there is another work attributed to Percier, which does not appear to have got into general circulation, 2 Parallèle entre plusieurs Residences de Souverains de France, d’Allemagne, de Suède, de Russie, et d’Italie, Paris, 1833, with thirty-eight plates. Percier died at Paris in 1838. 

PERCEBE. (or Percebi), a family of Acanthopterygious osseous fishes, of which the perch is the type. The Percebeae have bodies covered with rough scales, ciliated at the margin. The edge of the opercle or preopercle is dentilated or spiny. The vomer, also jaws, and usually the palatine bones, are armed with teeth. Perca, Trachinus, and Mugilus are British genera of this family. Bergas is an inter-tropical percoid genus, containing two or three species remarkable for bright-red colours, tinged with golden hues. Holocentrum is an allied genus, including very beautiful fishes, mostly tropical species. Myripristis diversicolor, Holocentrum inermis, and Trachichthys are all in different lenticular spines. Trachichthys is also a genus of this family.

PERIDINM, a genus of infusorial fossils, which occurs in the Eocene beds. (Peridinium.)

PERICHEIROCRUS, a genus of fossil Crinoid echinodermata, found in the Silurian strata. (Austria.)

PERIODUS, a fossil fish from Steepy. (Agassiz.)

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Martiús says P. petandria, another species, is employed in Brazil, under the name of *Rauy de Pipí*, in warm baths and lotions for defective contractility of the muscles or in paralysis, when the feet are cold. (Lindley’s *Flora Medica*; Burnett’s *Outlines of Botany*.)

PETROSELINUM (parente sylwvov, which means ‘rock parsley,’ rock being the habit of the species,) a genus of the Umbelliferae. It has an oblong calyx; roundish entire incised petals, scarcely emarginate, contracted into an inflexed lobe. The disk is short and somewhat antrorse. The fruit is oblong and compressed. The species are smooth-branched herbs. The leaves decompose, with wedge-shaped segments. The involucres many-leaved; the flowers are white or greenish, unisexual; those of the disk often sterile. The stamens longer than the style.

*P. sativum*, common Parsley, is described under *Parsley*, P. C.

P. sativum, Corn Honewort, has pinnate lower leaves; no petiole; ovate, ovate and serrated, the upper leaves entire or trifid. The umbels are very irregular, the general inflorescence having from 1 to 2 leaves. The flowers are whitish, in dense axillary racemes, and from the fact of its being cured a swelling in the cheek called a bone.

The species are easily cultivated and can be raised only from seed.

(Don’s *Gardener’s Dictionary*; Babington’s *Man. of Brit. Bot.; Lindley’s *Flora Medica*; Burnett’s *Outlines of Botany*.)

PEUCE, a fossil Coniferous tree, of which the species occur in the colitic strata. (Witham.)

PEUCE-DANUM (the πυξίδανος of Theophrastus and Dioscorides, from ψύξις a pine, on account of the resinous smell of the plant), a genus of plants belonging to the natural order Umbelliferae and the tribe Peuceae. It has a calyx of 5 teeth, obovate petals, contracted into an inflexed segment, emarginate or nearly entire. The fruit has a dilated thin flat margin, the carpels with equidistant ridges, 3 dorsal flaments, 2 lateral close to the base of the dilated margin obsolete. The stectarices have single linear vittae. The species are perennial, generally smooth. The leaves are pinnate, more or less compound. The flowers are white, yellow, or yellowish green.

P. officinale, Sulphur-wort, or Hog’s-fennel, is a smooth herb 3 or 4 feet high, with a resinous juice and a strong sulphurous smell. The leaves are four or even five times divided, with a broad, smooth, almost obtuse segment. The involucres 3-leaved and deciduous; the pedicels much shorter than the flower. The fruit of a pale brown colour, the vitre of a deep chocolate; the primary ridges much depressed and flattened, the second them a little obtuse. With a light crimson vitre very evident upon it. It is native in marshy and shady places throughout Europe and in Great Britain. The juice of the root of this plant is resinous and has a peculiar, strong, bitterish, acrid taste, resembling the qualities have been attributed to it, and it is reputed anti-aphomodic and diuretic, but it seems to be rather a dangerous internal remedy.

P. ocecum, a taper striated stem. Trifoliate leaves with the petioles broken back, the leaflets remote, ovate, deeply pinnatifid and shining. The fruit is roundish oval. The flowers white with a tinge of blue. The leaves and stem are bitter and aromatic, and are used in a higher degree. They were formerly used as stimulants, and are still esteemed in some countries.

P. montanum is a native of the north and middle of Europe, and has tapering simple root with many long fibres. The stem is erect from 4 to 5 feet high, hollow, deeply furrowed, smooth branched, and corymbous at the top, and of a bright purple colour at the base. There are about 5 or 6 leaves on a stem, which are alternate, remote, and with bipinnate divisions; the leaflets are opposite, deeply pinnatifid, dark green and smooth; the petioles striated, smooth, with a reddish membranaceous margin. The flowers are white and numerous; the fruit is a small straw-coloured thimble. The root is said to supply the place of ginger in Russia. The whole plant abounds in a white bitter fettid juice which so hardens into a brown acid resin. It is a famous remedy in Cowland in epilepsy.

P. palustris has 3-pinnate leaves pinnatifid with linear lanceolate acuminate segments, the general involucres of many persistent lanceolate deflexed leaves. The stem is furrowed and from 3 to 6 feet high. The flowers are white, it is found in Great Britain, but rarely. Any common garden soil will suit the species of Peucedanum, and they are easily raised from seed.

(Don’s *Gardener’s Dictionary*; Babington’s *Man. of Brit. Bot.; Lindley’s *Flora Medica*; Burnett’s *Outlines of Botany*; Lindley’s *Vegetable Kingdom*.)

PEVELEY [Sussex, P. C.]

PEZIZA [H.]. (Don’s *Gardener’s Dictionary*; P. C. S. J.)

PHACOPS, a genus of Tribolites, found in the Silurian strata. (Emmerich.)

PHALEMA, one of the three Linnaean genera of Lepidopterous Coleoidea. It corresponded to the division Nocturna in the arrangement of Latreille. It included the Night-moths. The *Phalema* are now distributed among many genera, all of which form part of the division Heterocera in M. Boisdail’s arrangement of Lepidoptera.

PHALLUS. [GASTROCOMIUM, P. C. S. J.]

PHANTOMS, a genus of fossil Gasteropoda, from the mountain-limestone of England and Ireland. (Sowerby.)

PHANTASMOGORIA. [MAGIC LANTERN, P. C. S. J.]

PHARBITIS, a genus of plants belonging to the natural order Convolvulaceae. It has 5 sepals, a campanulate funnel-shaped corolla, 5 granulate stamens, a 3-celled rarely 4-celled ovary, and 2-seeded pods. The species of this genus are easily distinguished from others of the same order: they are mostly climbing American herbs, usually beset with retroglobose glands.

P. Nil has twining annual round hairy branches and stalked, 3-lobe, downy leaves, axillary peduncles from 2 to 3-flowered, the flowers large, of a beautiful light bright blue colour. The capsule is much shorter than the calyx, smooth, 3-celled, with two seeds in each cell. The seeds are sold in apothecaries’ shops of Calcutta under the name of ‘Kalana’ and are said to act as a purgative and an effective speedy curative, mixed like coffee, powdered, and administered in doses of from 30 to 40 grains.

It is native of the tropics in every part, and in the South Sea Islands.

There are about fifteen species of this genus, but the one described is the only one of use in medicine. They are however showy plants, and should be reared in a hotbed and then planted out in a warm sheltered situation. A light rich soil or a mixture of loam and decayed leaves suits it best.

(Don’s *Gardener’s Dictionary*; Lindley’s *Flora Medica*.)

PHASCOCHERUS. [SUZDA, P. C.]

PHILIPS, THOMAS, R.A., one of the most distinguished botanists. He was born at Dudley, in Worcestershire, October 16, 1770. He was placed very early with Mr. Edgington at Birmingham to learn to paint on glass; and he came to London in 1790 with a letter of introduction to Mr. West, and was placed in the green-house of the Earl of Chesterfield at St. George’s Chapel. In 1792 Phillips exhibited a view of Windsor Castle from the north-east; and in the following year he exhibited two historical pictures—the Death of Talbot, earl of Shrewsbury, at the Battle of Cassillon, and Ruth and her Mother-in-law. He exhibited likewise two pictures of similar classes in 1794—Cupid disarmed by Euphrosyne, and Elijah returning the Recovered Child to the Widow. He seems in the year 1796 to have already turned his attention to portrait painting, for from that year he appears chiefly in the Exhibition notices as a portrait painter, though he occasionally painted some historical pieces. It is as a portrait painter however that he acquired his reputation, and as such he will be known; for nearly half a century he was a favourite exhibitor, and for a great portion of the time the encouragement he met with was not limited to applause, as is often the case, but he was substantially patronised, and fully occupied, notwithstanding the rivalry of Hoppner, Owen, Jackson, Lawrence, and others of nearly equal reputation; few however of the nobility sat to him.

In 1804 he removed into No. 8, New Bond-street, Hanover-square, where he remained until his death. In 1808 he was made a member of the Royal Academy, to which he presented a picture of Venus and Adonis as his diploma piece; there is a fruit tree, and a strabismous thimble of this House. In 1824 he succeeded Fuseli in the professorship of painting, an office which he held until 1832; and he delivered in all ten lectures, which he published together in one volume 8vo. In 1832, dedicated to the Earl of Egremont, under
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the title 'Lectures on the History and Principles of Painting:'
the sixth on Design; the seventh on Composition; the eighth on Colouring; the ninth on Chiaro-recto; and the tenth on the Application of the Principles of Painting. The subject of this paper is the solution in art, and the constructive in substance and arrangement, especially in some of the author's expositions of his views of the principles of art.

The author made a tour in Italy with Hutton, in 1894, after his appointment to the professorship, and before the delivery of any lectures, in order to be able to discharge the duties of his office more efficiently. He died April 20, 1845. He was one of the trustees of the Royal Academy.

The son of Lord Thurlow, painted in 1802; one of Napoleon, of the same year, but which was painted chiefly from memory, Napoleon did not sit for Phillips; the Prince of Wales, in 1806; Blake the painter, in 1807; Sir Joseph Banks, as president of the Royal Society, in 1809; two of Lord Byron, in 1814, one in an Albanian dress; Hetman Count Plasoff, the Cosack general, on his charger, in 1816, the horse was painted by J. Ward, R.A.; Sir P. Chantrey, in 1818; the poet Crabbe, for Mr. Murray, in 1819; Earl Grey and Lord Brougham, in 1820; the Duke of York, for the town-hall of Liverpool, in 1823; Major Denham, the Architect, in 1824; first, to exhibit at the Royal Academy in London, in 1826; Lord Stowell, Sir E. Parry, and Sir J. Brunell, in 1827; Wilkie, in 1829; Mrs. Somerville and Sir Francis Burdett, in 1834; Mr. Justice Littledale and Lord Lyndhurst, in 1836; the Duke of Wellington, in the town-hall of Liverpool, and Lord William Bentinck, in 1838; Rev. Dr. Arnold, and the late Earl of Egremont, a portrait painted in 1839; the Duke of Sussex, in the chair of the Royal Society, and Sir Nicholas C. Tindal, late Lord Chief Justice of the Common Pleas, in 1840; Dr. Shuttleworth, late Bishop of Chichester, and George Green, Esq., for the town-hall, in Dublin, in 1844 and 1845. He painted also portraits of Lord Byron and some other poets and writers for the late Mr. Murray, of Albanmear-street, comprising those of Sir Walter Scott, Campbell, Southey, Coleridge, and Crabbe the elder. He painted very few pictures besides portraits after the establishment of his name as a portrait-painter. He exhibited a piece called Field Sports in 1832; Rebecca, in 1833: a Nymph Reposing, in 1837; and in 1839 a picture of Flora MacIvor having received the letter sent to her by her brother Fergus on the morning of his execution at Carlisle. His last picture of this class is said to be the Expulsion from Paradise, at Fetworth. He was the author of the 'Lexicon of Gastronomy,' and Tract on the 'Philosophy of the Human Mind.'

[Philosophy, P. C.]

Philosophy, Positive. The distribution of philosophy in the old and the new, is chiefly to be found in the German school. Thus Kant's 'Kritik der Reinen Vernunft,' his 'Prolegomena zu einer jeden Künftigen Metaphysik,' and his 'Kritik der Urkritik,' are regarded as forming a sort of Prima Philosophia, preparatory to a positive or formal and detailed system of metaphysics. For though the philosophies which have successively arisen in Germany since Kant's day, such as the doctrines of Fichte, the Transcendental Idee of Schelling, the Phenomenology and Logic of Hegel, or the Metaphysics of Herbart, are all genealogically descended from Kant's Critic review (the reason which was made by him to engage in, of the faculties of the soul), yet Kant himself, in his Critik, did not profess to do more than pave the way for a system or dogmatic of speculative philosophy. Hence Rinner observes:—

Billig haben alle diese Lehrgemeinde nicht selbst für acht Philosophie im positiven Sinne, sondern nur für Philosophie im negativen Sinne, d. h. für universalen Protestantismus gegen alle philosophische Anschauungen des seine eigene Grenzen miskennenden Verstandes erkannt und gehalten.

Dennoch hat dieses 'Kritik' von Kant (Anders, 'Geschichte der Philosoph. Bd. iii. § 129').

These are right who have regarded Kant's doctrine not as genuine philosophy in the positive sense, but as philosophy in the speculative, or, as the a priori, or, as the speculative pretensions of an understanding which does not know its own limits. For Kant proceeds throughout, only in the way of�试题, that the idea of a thing is on Invention, the sixth on Design; the seventh on Composition; the eighth on Colouring; the ninth on Chiaro-recto; and the tenth on the Application of the Principles of Painting. The subject of this paper is the solution in art, and the constructive in substance and arrangement, especially in some of the author's expositions of his views of the principles of art. The author made a tour in Italy with Hutton, in 1894, after his appointment to the professorship, and before the delivery of any lectures, in order to be able to discharge the duties of his office more efficiently. He died April 20, 1845. He was one of the trustees of the Royal Academy. The son of Lord Thurlow, painted in 1802; one of Napoleon, of the same year, but which was painted chiefly from memory, Napoleon did not sit for Phillips; the Prince of Wales, in 1806; Blake the painter, in 1807; Sir Joseph Banks, as president of the Royal Society, in 1809; two of Lord Byron, in 1814, one in an Albanian dress; Hetman Count Plasoff, the Cosack general, on his charger, in 1816, the horse was painted by J. Ward, R.A.; Sir P. Chantrey, in 1818; the poet Crabbe, for Mr. Murray, in 1819; Earl Grey and Lord Brougham, in 1820; the Duke of York, for the town-hall of Liverpool, in 1823; Major Denham, the Architect, in 1824; first, to exhibit at the Royal Academy in London, in 1826; Lord Stowell, Sir E. Parry, and Sir J. Brunell, in 1827; Wilkie, in 1829; Mrs. Somerville and Sir Francis Burdett, in 1834; Mr. Justice Littledale and Lord Lyndhurst, in 1836; the Duke of Wellington, in the town-hall of Liverpool, and Lord William Bentinck, in 1838; Rev. Dr. Arnold, and the late Earl of Egremont, a portrait painted in 1839; the Duke of Sussex, in the chair of the Royal Society, and Sir Nicholas C. Tindal, late Lord Chief Justice of the Common Pleas, in 1840; Dr. Shuttleworth, late Bishop of Chichester, and George Green, Esq., for the town-hall, in Dublin, in 1844 and 1845. He painted also portraits of Lord Byron and some other poets and writers for the late Mr. Murray, of Albanmear-street, comprising those of Sir Walter Scott, Campbell, Southey, Coleridge, and Crabbe the elder. He painted very few pictures besides portraits after the establishment of his name as a portrait-painter. He exhibited a piece called Field Sports in 1832; Rebecca, in 1833: a Nymph Reposing, in 1837; and in 1839 a picture of Flora MacIvor having received the letter sent to her by her brother Fergus on the morning of his execution at Carlisle. His last picture of this class is said to be the Expulsion from Paradise, at Fetworth. He was the author of the 'Lexicon of Gastronomy,' and Tract on the 'Philosophy of the Human Mind.'

PHILIA'RIA was a small territory bounded by Secunia and Cornithia on the north and Arcadia on the west. The chief town, Philias, is mentioned in Homer under the name Aramythys. The old Philians were Argoli, but the population became Dorian in consequence of the invasion of the Heraclidae (Pausania, ii, 12) and the settlement of some Dorians in the territory. This little state was the mart of 200 men to oppose the Persians at Thermopylae, n.c. 480, and in the following year it sent 1000 men to oppose them at Plataea. (Herod. vii. 202; ix. 28.) In the Peloponnesian war the Philians were on the side of the Spartans, as was natural, as they were a Dorian state. Its position and comparative feebleness exposed it to hostile invasions from the Athenians, when they were leagued with Sparta, and from Sparta when a cause of quarrel arose with that powerful state. When Philus was reduced by Aegaeusus, n.c. 379, it had above 5000 citizens. ( Xenophon, Hellen. v. 3, 11.) At the time of the formation of the Achaean league, Philus was under Lacedaemon, and it was a prince who raised its power and induced the people to join the confederation. Philus is placed by Pausania at the distance of 40 stadia from Titane, and he says that the road to Philus from Sicyon was straight. At Sicyon the old Agis and Agis Giorgios (St. George), and there are said to be traces of several temples on the height above the river Anopus. Pausania mentions two temples on the acropolis, a temple of Aesculapius on the right side of the acropolis, and a theatre near it. Ceasea, a small place, was four stadia from Philus.

(Pausania, i, 12, 6c.; Strabo, p. 389, ed. Caunaou; Crater of Greece, iii. 288.)

PHILUS. [Philiasia.]

PHILOPHORUS, a genus of fossil fishes, from the Fossils of England. PHOSPHORESCENCE IN PLANTS AND ANIMALS. Organic bodies under certain circumstances become luminous, and upon the supposition that this appearance depends on the combustion of phosphorus at a low temperature, the phenomenon has been called phosphorescence. This luminosity is very constantly developed under the same circumstances in both animals and plants. It is observed both during the decomposition of the bodies of plants and animals as well as whilst they are living. The oldest observations on this subject were made on the wood of trees whilst in a state of decay. This however takes place only under peculiar circumstances. It generally occurs when the wood of trees is buried in the ground, and does not take place when wood is allowed to decompose.

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in the usual way and in free contact with the air. It is also found that the phosphorescence does not take place when the wood is allowed to decompose in a damp place. Wood exhibiting this property will retain it for a long period when kept dry. In the Rhizomorphosen, on the other hand, during the night at a spot where one of its branches had been torn off, Decaying fungi have been often observed to emit this light. Travellers in tropical climates have observed that when plants containing a milky juice are wounded, the juice frequently becomes luminous, whilst it is descending the sides of the tree. The cause of this phenomenon in decaying plants is probably owing to a slow decomposition of the tissues surrounding the union of oxygen gas, but what determines the development of light under these more than other circumstances is still unknown.

In living plants luminosity has been repeatedly observed. It is most constant amongst some forms of fungi, especially of the genus Rhizomorphose. In the coal-mines in the vicinity of Dresden the species of Rhizomorphose are so numerous as to dazzle the eye by the brilliant light they afford. [Bryaule, P. C. S.]. The light from decaying wood, as also from the living Rhizomorphose, continues although they are immersed in irrespirable gases, ligned oil, phosphoric acid gas, oxygen, etc. The phenomenon in both the living and the dead can at times be seen due to the same cause, namely a blue light—often visible, in the air, around the fire—"the Elateride, and the glow-worm—the Lampyris, are the most distinguished. [Elateride, P. C.; Lampyris, P. C.]. Some of the species of the Elateride have been found in the night light occasionally, as the centipede and the common earthworm. (Maycan, Pflanzen-Physiologie, Band li; Carpenter, Animal Physiology; Lancaster, Gardener's Chronicle, 1843.)

Another class of plants in which light has been observed is the Mosses. Several species of the genus Schistostega, which grow in caverns and other damp places, have been observed to emit light. Mr. Buckland and other botanists have observed it in this country in the S. pennata; whilst Funk, Brandenburg, Nees von Esenbeck, Horsnuchze, Struve, Unger, Bridge-Briereide and Agardh, have observed it in other parts of the globe. The light was emitted in a small alga, which Bridge-Briereide called Catoptrium, a small alga, and Agardh called Polysaccus, which they supposed was parasitic on the moss. Unger named it Polysaccus, and Brielu-Briereide the most accurately, and finds that at certain seasons the urticules of this moss assume a globular form, and being partly transparent, the light is refracted and reflected in such a way as to present a luminosity on the surface of its rays.

Another class of these phenomena is that which is exhibited by the flowers of some plants. The first observation on this subject was recorded by Linnaeus, and made by his daughter Christina Linna. She was walking in the garden one hot summer's evening, when she observed the flowers of Tropeolum majus to give forth a stream of light. This was attributed by many to an optical illusion, but the fact has since been repeatedly observed on this as well as other plants. We are not perhaps in a position to say this was not an optical illusion; but if it was, one would expect that it should be more constant. It has also been seen by several observers at the same time in the same garden by Linna itself; and while others have seen it also. A correspondent of the 'Gardener's Chronicle,' October, 1844, says: I have frequently observed the luminous appearance of garden plants, and have looked for the same effect on those of the same species that have been grown in pots. I may say more especially on the Papaver pilosum, the hairy red poppy, in my garden at Worcester. In the evening after a hot dry day, the flashes of light have afforded much amusement to myself and others. It is to this phenomenon that Coleridge alludes in the following lines:

The mold on summer's evening hour
Flashes the golden-hued flower
A fair electric flame.

Decaying animal bodies frequently emit a luminous appearance, which has generally been attributed to the presence of phosphoric lime in their skeletons, which become decomposed and yield phosphores when exposed to the action of organic compounds in a state of decomposition. It is to this cause that the luminosity of putrefying fish is attributed. Light has also been observed on the bodies of those dying of spontaneous combustion. [Combustion, Stockburn, P. C. S.]

But the emission of light is a very constant phenomenon of many of the invertebrate animals under peculiar circumstances. Thus during warm weather, when a vessel passes through the ocean, very often one will observe a light being given off faintly and there streaks and stars of a brighter light. This occurs in our own climate, but the phosphorescence is much more brilliant in tropical seas. Poppit, in his 'Reise in Chili, Peru, and Tierra del Fuego,' describes a phenomenon of a similar nature in an equatorial sea. Whilst one side of the vessel is still illuminated by the last fading rays of the evening sun and the opposite side darkened by the shade of the sails, the sea in this direction already becomes brilliant. One spot after another begins to be illuminated, indistinct stripes of light commence glistening from greater depths, till at last the whole of the space is filled with a dim light. A great number of these beings are undoubtedly true night animals which conceal themselves during daylight in the dark depths of the ocean. These lights in the sea are principally produced by various species of the family Acaleph, or jelly-fishes. The light emitted by these animals seems to be due to the secretions on the surface of their bodies, for when this secretion is removed it retains for some hours its luminous character, and will even impart it to milk or water. But this property is not confined to the Acaleph; many species of Polypiere, some of the Echinodermata, and the lower forms of Molusca, also exhibit this appearance.

Some few of the Crustacea and even fishes have been observed to possess the same property.

Amongst insects this phenomenon is not uncommon. Those which possess the greatest luminosity power belong to the Coleoptere, and the Autophane tribe, namely the families represented by the fire-fly—the Elateride, and the glow-worm—the Lampyris, are the most distinguished. [Elateride, P. C.; Lampyris, P. C.]. Some of the species of the Lampyris have been found occasionally, as the centipede and the common earthworm. (Maycan, Pflanzen-Physiologie, Band li; Carpenter, Animal Physiology; Lancaster, Gardener's Chronicle, 1843.)

In the present work, we have given the results of several inquiries upon the phenomena of light in a camera-obscura, by chemical agency, permanently impressed upon prepared metallic plates; although it is intimated that similar effects had been, though less perfectly, produced by other persons. Some years ago, Mr. C. H. Smith discovered many curious facts have been discovered respecting the chemical action of light, and the various means of rendering the results of such action both permanent and visible to the eye in a pictorial form, although yet the art of photography, or light-drawing, remains in an experimental state. We shall therefore merely notice a few general points, referring the more curious to the scientific journals of the last few years, and especially to the numerous papers published in the 'Athenæum' and the 'Art-Union,' for further information as to the processes employed, the discoveries made, and the theories proposed, by the numerous individuals, in this and other countries, whose ingenuity has been called into exercise by this new and curious art. One of these individuals, Mr. Robert Hunt, secretary to the Royal Cornwall Geological Society, published in 1844, in an octavo volume, a valuable contribution to the history of the art of photography, under the title of 'Researches on Light,' professing to contain 'an examination of all the phenomena connected with the chemical and molecular changes produced by the influence of the solar rays; embracing the fundamental principles of the known photographic processes, and new discoveries in the art.'

Though not absolutely the earliest as regards the date of its discovery, the Daguerrotype claims notice before any other branch of this new branch of physical science, having been the first to attract general attention, and being also that which appears to have made the nearest approach to
practical perfection. The peculiarities of Daguerreotype pictures being already described under Photographic Drawings, P. C., it is only necessary here to refer to some of the more important recent improvements, in consequence of which the practice of the art is steadily gaining ground, it being already on the point of extending itself to the instruction of minor craftsmen, views of buildings, &c. A pretty full account, illustrated with engravings of the apparatus employed, of the Daguerreotype process, both as originally practised in this country under the use of the original patents of Mr. Richard Beard and M. A. J. F. Claudet (both of whom had purchased licences of M. Daguerre), is given in his "Supplement" to his "History," &c., &c., and "Daguerreotype," issued in the fifty-fifth volume of the "Transactions" of the Society of Arts (pp. 89-110), is a paper presented to the Society, in December, 1843, by M. Claudet, on "The Progress and present State of the Daguerreotype Art," in which much valuable information is conveyed. In addition to such improvements as could only be satisfactorily explained in connection with a minute account of the process, these sources of information show that much has been done in rendering Daguerreotype portraits more correct and more pleasant by the improved management of light, and by placing behind the sitters painted screens, to relieve the head, and to form artificial features. In this process the original process arose from the circumstance, that, as the image produced in the camera-obscura was totally invisible until brought out by a subsequent exposure to the vapour of mercuric bromide, the action of the light could not be stopped, to avoid, on the one hand, an image imperfectly developed, and, on the other, the misty, indefinite appearance occasioned by the unavoidable motion of the subject, the animal (or object), and the discoloured or burnt appearance of an image which has been exposed too long to the chemical action of light. This inconvenience is remedied by M. Claudet's method of applying the mercurial vapour in the camera-obscura simultaneously with the action of light, and providing means to enable the operator to watch the progressive development of the image. One important class of improvements has reference to the object to be photographed. It is to be prepared by the subsequent action of light or other means, the Daguerreotype image. M. Claudet, in the paper above referred to, after alluding to some inventions for this purpose, observes, that it was left to Mr. Fizeau to discover what has proved one of the greatest improvements in the Daguerreotype process, and which consists in fixing the delicate image by means of a transparent coating of gold, applied by boiling upon the plate a solution of chlorate of gold, which not only renders the image more durable, but has the advantage of increasing the tint, so that a picture fixed by Mr. Fizeau's process is rendered more forcible, and the mirror-like effect is almost destroyed. M. Claudet, in his "Daguerrotypie," pp. 292-295, is the author of a number of experiments, by M. Ulex, of Hamburg, to test the durability of Daguerreotype impressions, from which it appears that they may be rendered insensible to the action of light by being boiled in a solution of boracic acid and of nitrate of copper, and that, even when rubbed away with leather and rotten-stone, they may be reproduced by the action of heat. On p. 292 of the same volume is an announcement of a method of Daguerreotyping in colours, by Professor Böttiger, of Frankfort-on-the-Main, by which, however, it is observed that "as yet he has only succeeded in bringing out three colours, of which the flesh-colour is the most perfect." In the absence, however, of any further and fuller account of this invention, we are led, from the results obtained by other experimentalists, to suspect that in this, as in the other cases about to be mentioned, the colouring was not simply the result of the action of various colours on the plate, but was the result of the action of Daguerreotypes, some of which make a tolerably near approach to the effect which might be expected if colours could be fixed in the camera-obscura, the tinting being produced by the application of fines and of spirit to the surface of the photographic impression, which is previously coated with an alcoholic solution of copal, and nearly dried; so that the colouring, which is so delicately performed as not to impair the distinctness of the image, is due to the volume of spirit, and not to the action of light. Since this mode of colouring photographic drawings has been in use, a new and ingenious process has been invented by C. G. Page, professor of chemistry in Columbia College, U. S., and wash the plate in a solution of nitrate of silver, the mixture, applied with a soft brush, observing that the operation must be performed by candle-light. After a pause of a
half a minute the paper should be dipped into pure water, then blotted dry, and finally dried at a considerable distance from a fire. It is then ready for use, and if kept in a press, sealed up, it will sometimes keep good for three months; but as this is not to be depended upon, Mr. Talbot recommends the final preparation of the paper only a few hours before using it. It is so sensitive, that a momentary exposure to the light of a cloudy window, is sufficient to produce an impression; but the impression so produced is latent and invisible. In this state the paper is subjected to the action of light in a camera obscura, after which the image is renewed by washing it again with the gallo-nitrate of silver, and warming it before a fire. In some cases, however, a strong impression will become visible in a minute or two after applying the gallo-nitrate of silver, without the aid of heat. The image thus brought out is subsequently fixed, rendered permanent by washing with water, lightly drying with blotting paper, and then washing with a solution of bromide of potassium containing 100 grains to eight or ten ounces of water. This solution the paper is again dipped in water, and finally dried. The picture thus produced is what is termed a negative one, in which all the light parts of the object represented are shown as a dark colour, and the representatives the reverse of the original in position. It is, however, according to Mr. Talbot’s second patent, rendered transparent by the application of wax, and by laying it face downwards upon a sheet of paper, and exposing both to the light, a copy is produced in which the objects are brought into their true position, and the right effect of light and shade is obtained; the copy, or secondary impression, having been obtained from the appearance of a sepia drawing. By this arrangement one original negative Calotype may be employed to produce a great number of secondary positive copies; and although it sometimes grows faint after frequent repetition of the process, its strength may be renewed by washing it in gallo-nitrate of silver, and subsequent warming. The positive Calotypes, it should be observed, may be taken upon paper prepared as above described for the negative or original impressions; but Mr. Talbot recommends for them being prepared by washing first with a weak solution of common salt, and then with a solution of nitrate of silver; as such paper, though requiring more time for the perfect action of the light, affords an image with tints more harmonious and pleasing to the eye than the more sensitive paper above described. In obtaining the secondary impressions the original and the sheet of photographic paper are laid upon a board and covered with a piece of glass, which is pressed down to keep them in close contact with each other. The images are subsequently fixed in the same way as the original. The sharpness and delicacy of Calotype, or Talbotype, pictures is somewhat impaired by these processes; so that the imitation of the light and shade that even the texture of the paper on which the negative picture is taken is imitated in the positive Calotype, by which circumstances a certain objectionable woolliness of texture is given to the whole; which will doubtless be greatly reduced, if not entirely done away with, some very pleasing representations of buildings and other objects have been produced by the Talbotype process, many of which are published by Mr. Talbot in a work appropriately called ‘The Pencil of Nature,’ the illustrations of which are not prints, but actual photographic or sun pictures. By this process, also, a perfect fac-simile of the recent Chinese treaty has been obtained, which copy is deposited among the State Papers.

The Daguerrototype and Talbotype processes, though they may be regarded as the types of two great branches of the photographic art, are but two out of many processes which have been devised for producing pictures or images by the agency of light. On this point we cannot do better than quote a short passage from the Athenæum for 1845, p. 203, promising that in the pages of that journal may be found pretty full details respecting all the processes referred to, and of some others also. ‘It is a startling fact,’ observe the editors of the article quoted, ‘that all substances, from the delightfully sensitive film which is the formation of the silver plate in the Daguerrototype process, to all the salts of the metals, and even to the metals themselves, or plates of glass or of paper, are capable of being impressed with light.

A shadow cannot fall upon any solid body without leaving evidence behind it, in the disturbed and disordered condition of its molecular arrangement in the parts in light and shade.’ ‘It is evident, then,’ he proceeds, ‘that all bodies are capable of photographic disturbance, and might be used for the production of pictures, if we knew of easy and simple methods of producing such disturbance. We are not without hope that these means may be discovered. It must be remembered that in all the best photographic processes, the images are invisible at first. In the Calotype process they are colourless, and in the Daguerrototype, the picture is brought out by mercurial vapour. In the Chromatotype, nitrate of silver is the active material for the same purpose; and it may be used to bring out the image in a minute, but pictures are formed only when a latent image is produced by the influence of the ferro-prussiate of potash. The Amblytype, and some other processes, the result of the researches of the same investigator, Sir J. Herschel, are of a remarkable character; and we therefore, he subsequendy observes, ‘led to inquire, Is this a new element, distinct from light, heat, and electricity, or is it a modification of one of these?’ Further researches only can settle this point.

Mr. John Herschel proposed the name of Actinium, invisible for this new branch of physico-chemical science, and it has been suggested that Actinium would be an appropriate term toundistinguish this chemical power from the light and heat which it produces. But with this subject we may refer to the circumstance mentioned by M. Claudet in his paper already referred to, that the operation of the Daguerrototype has been found to be much more subject to the same defects than that of other processes; and to the evidently different effects produced in the Talbotype process by different coloured rays, a circumstance which renders the foliage of some landscapes thus produced very difficult to be equally sensitive to all the rays. In this paper is an important correction of an erroneous notion which appears to have been commonly received, that the light of the moon would not set photographically, it being supposed that the chemical principle, or actinimum, of the rays of solar light was absorbed by the moon’s surface. In answer to this we are informed that photographic impressions have been obtained by moon-light both upon Daguerrotypes and Talbotype paper; thereby showing that the moon’s beams are of the same character as, though of less intensity than, the rays received directly from the sun. Both kinds of photography have been performed upon light emitted from lime ignited by the oxy-hydrogen flame.

Of an art so new it would be premature to attempt to enumerate the advantages of receiving light upon metal; but it is mentioned the procuring of accurate representations of the most complicated scenery, to be used in aid of an artist’s memoranda for the production of landscapes, architectural re-
PHYLODODOCÉ, a genus of plants belonging to the natural order Ericaceae. It has 5-parted calyx, an ovate corolla with a contracted 5-toothed mouth, 10 stamens enclosed, slender glabrous filaments longer than the anthers, short truncate cells opening by pores at the apex. The seeds are compressed and shining. The species are small evergreen shrubs, natives of the north of Europe, Asia, and North America.

P. coriacea has linear leaves with deutilculated margins, glabrous hairy peduncles; calyces lanceolate-acute segments; anthere three times shorter than the glabrous filaments. The stem is from 4 to 6 inches high, determinately branched, naked below, densely hairy above. The flower is large, pale alutaceous, the peduncles alutaceous, aggregate, and inferior. The plant is native of Peninsular and North of England. There are three other species of Phyllocladus, which are natives of North America. They thrive only in a west soil, in an open, rich, loose, composty layers. They are a genus of elegant, small, heath-like plants.

(Don, Gardener's Dictionary; Babington, Manual of British Botany.)

PHYLLODUS, a genus of fossil fishes from Sheppey. (Agassiz.)

PHYSALIS (from φυσάλη, a bladder, in reference to the inflated calyx), a genus of plants belonging to the natural order Solanaceae. It has a 5-parted calyx, a campanulate, rotate 5-lobed corolla, converging anthers opening longitudinally, a capitate stigma, smooth 2-celled berry, covered with the angular membranous inflated calyx. The species are annual or perennial herbs, rarely shrubs.

P. seminifera has several shrubby branched stems, round and downy. The leaves are in lateral pairs, short stalked, ovate, downy, and from 2 to 4 inches long. The flowers are axillary, subacute, minute, small, crowded, and of a greenish yellow or white.

The berry is red and smooth, and about the size of a pea. This plant is the φυσάλη φυσαλίσιος of Theophrastus, Hist. Plana. IX. 12; and the φυσάλη ευκερά of Dioscorides, 4. 72. 1. It is native of Europe and the southern parts of Europe. It is reputed to be narcotic, diuretic, and aleuriphasmic. The leaves steeped in oil are in India applied to inflammatory tumours, and they are used in a similar way in Egypt. Kunth recognised this plant in Egyptian mum-mies.

P. Alkekengi, the Winter Cherry, is an herbaceous downy plant, with a perennial creeping root; ovate deltoid leaves; spotting flowers, ovate coloured calyx, and subulate segments. It is a native of Europe on exposed hills, and of Japan. The corolla is a dirty white; the calyx reddish yellow, enclosing a red berry. The fruit of this plant was well known to the ancients, and is described by Dioscorides. In this country, however, the fruit is seldom eaten, and the plant is cultivated chiefly on account of its appearance. In Arabia and Armenia, Spain and Germany, however, the berries frequently supply the place of apples. They have a sour acid and not unpleasant flavour, but the persistent calyx with which they are invested is very bitter. Ray speaks of these berries as a preventative of gout, and others have extolled their diuretics, and recommended them in the treatment of dyspepsy.

P. pubescens, Downy Winter Cherry, is a native of North America and the East Indies. The whole plant is densely covered with down, and furnished with fine roundish brownish violet spots at the throat. The berries are yellowish when ripe; they are called gooseberries, and are used as a substitute for them in many parts, and when preserved with sugar form excellent preserves. It is the Camera of Brazil. All the species of Physalis thrive best in a light rich soil, and are easily propagated by seed, and cuttings will take root under a glass-house.

(Don, Gardener's Dictionary; Lindley, Flora Medica; Burnett, Outlines of Botany; Fraas, Synopsis Plantarum Florae Classica.)

PHYSONELUS, a genus of fossil fishes from the mountain-limestone from the north of France. (Aguin.)

PHYSOPERMUM (from φυσόπερμα, a bladder, and περμανήμα, a seed, in reference to the tegument not adhering to the seed when young), a genus of plants belonging to the natural order Umbelliferae. It has a one- or two-celled calyx, the fruit petals with an infixed point; the fruit laterally compressed; the carpels reniform, globose, didymous, with five filiform slender equal ridges, the lateral within the margin. The interstices with single to a thick vitia. The species are perennial herbs, the flowers white.

P. Cornubianae has triterete radical leaves, wedge-shaped leaflets deeply toothed, the stem-leaves ternoate, lanceolate, and entire; the stem from one to three feet high, erect, round, striated, minutely scabrous, bearing a few small ternoate leaves with linear lanceolate segments; the umbels are terminal; the carpels longer than broad; the coat loose. It is native only of Cornwall, in bushes and hedges; in great plenty in the neighbourhood of Bodmin. Cattle are so fond of this plant that they will eat it down to the ground. The root contains a yellow resinous juice. There are but few species of this genus. Any common cow will suit them, and they may be divided at the root or raised from seed.

(Don's Gardener's Dictionary; Babington's Manual of British Botany.)

PHYTELEPHAS. [Vegetable Irony, P. C.]

PHYTEUMA (a name adopted by Dioscorides), a genus of plants belonging to the natural order Campanulaceae; it has a 5-parted calyx, a rotate convex segments; free anthers, and filaments dilated at the base. P. orbiculare, Round-headed Rampion, has the heads of its flowers globose, those of the fruit oblong, the leaves crease-serrate, the lower ones cordate-ovate, stalked, the upper ones linear, lanceolate, sessile. It is native of the mountains of Europe and of England in chalky soil. The flowers are of a deep blue colour.

P. spicatum, Spiked Rampion, is distinguished by having the heads of its flowers oblong, those of the fruit elongated, cylindrical; the lower leaves cordate-ovate, the upper ones linear lanceolate, sessile; the flowers are white, cream-coloured, or blue. It is native of the temperate parts of Europe and in Sussex, in England. All the species are hardy and well fitted for garden borders or rockwork. They will grow in any common garden soil, and may be divided or raised from seed.

Campanula Riganocula is likewise known as the Rampion. (Rampion, P. C.)

(Don's Gardener's Dictionary; Babington's Manual of British Botany.)

PIAZZETTA, JOVAN/AI BATTISTA, one of the most celebrated of the later Venetian painters, was born at Venice in 1625 or 1635, and was first instructed in design by his father, Jacopo Piazzetta, a carver in wood. He was taught painting by his father, but he acquired his style, loggia from the works of Spagnolotto and Guecino. Piazzetta is one of the Naturalist school of painting, and he is one of the darkest of those who are sometimes called Teniers; they generally painted on dark grounds. He died at Venice in 1754.

Piazzetta's pictures are doubtless much darkened through time; they are distinguished by their strong contrasts of light and shade. His masterpiece is considered the Burial of John the Baptist, at Padua. He excelled in caricature. Many of his works have been engraved.

(Zanetti, Della Pittura Veneziana, &c.; Lanzi, Storia Pitteresca, &c.)

PICART, ETIENNE (called Le Roman, the Roman), a celebrated French engraver, was born at Paris in 1631, and died at Amsterdam in 1721. His prints, chiefly portraits and history, are of the most ingenious: they are firmly executed, but want harmony. He worked with the graver and the etching-needle, much in the style of Polliy. He is supposed to have been called Le Roman from his long sojourn in Rome, or he assumed the name that he might not be confounded with another engraver of the name of Picart. He was engraver to the king, and a member of the French Academy of Painting, &c.

BERNARD PICART, the son of Etienne Picart, born at Paris in 1663, was a designer and also a distinguished engraver, and superior to his father. He was the pupil of Le Clerc; his best works are those executed in France; in Amsterdam, to
which place he accompanied his father in 1710, he worked exclusively for the booksellers, and became mannered, met- 
tallic, and merely ornamental. A great many of his prints are from his own designs, in which he imitated the style of 
occasionally the firm of Cuper and Coppel. He was 
imitating the styles of other engravers, and he published many 
prints of this class which are said to have deceived col-
glectors; Picart used to call them Impostures innocentes, 
and they were so minutely imitated under this title that a 
number of them were sold with a list of his works, at Amster-
dam, in 1738, after his death. His prints altogeth
amount to about 1500; and one of the best of them is a Slaughter of the Innocents, after a design of Ruben, of it. The 
openings of the Tomb of Nitocris, after Le Sueur, is also one 
of his best prints; it is much in the style of Girard Andran. 
He died at Amsterdam in 1738. 
( Watel et Deveau, Dictionnaire des Arts, &c.; Huber, 
Manuel des Amateures, &c.)

PICO is one of the Azores, or Western Islands, so called from the 
remarkable volcano which it contains, and which is 
called "the Peak" (Pico). This island lies between 28° 9' and 
28° 42' W. long., and between 38° 15' and 38° 38' N. lat. It extends from west-north-west to east-south-east 
about forty-five miles, and is about eight wide towards 
its western extremity, and where it is widest, where it 
grows narrower as it proceeds farther east, until it terminates 
in a forked rock hardly a mile in width. The average 
width is about five miles. This gives an area of 225 square miles; 
which is nearly the same size as the Isle of Wight.
The coast-line is bordered by rugged rocks, which form no 
port nor allow an anchorage; at Lagoes, on the south coast, 
is a small cove, in which small craft find shelter. The western 
distance of the nearest rocky surface from the sea is about 
from the shores towards the peak, which occupies the centrepiece of 
this part of the island, and is more than 8000 feet above 
the sea. The soil is composed of lava, which in many places is 
entirely naked, and is covered in other parts with thin layer of 
earth, formed by the decomposition of volcanic matter. The 
country round the volcano and even the lower parts of 
its sides are richly cultivated, principally with vineyards; 
there are extensive plantations of mastic, and the soil is 
very fertile. From the cultivated grounds to within a third of the 
distance from the summit, it is thickly covered with splendid 
and evergreen cypress, the myrrhaya, white yew, immense junipers, 
myrtles, and tree-ferns, beyond which point vegetation begins 
to decline, and on approaching the top of the peak nothing is 
seen but moss and lichens. From the eastern base of the 
volcano a high ground runs eastward to Cape Calhagrossa, 
the eastern extremity of the island. It occupies the middle 
of the island, and descends with a very broken surface towards 
the northern and southern shores. Though this part of the 
island is lava-covered, it is entirely cultivated and forms a large 
portion of cultivable land, but is not so well cultivated as the 
country round the volcano. The southern declivities are 
much better cultivated than those which slope towards the 
orthern side, and are less covered with vegetation. 
The chief article of produce is wine. Until lately there 
were annually exported nearly 25,000 oaks. It is considered 
better than any kind grown in the Azores, and goes by the 
name of Fayal wine, because it is brought to foreign countries 
from Horta, the capital of the island of Fayal. Great 
quantities of fruit are also sent to Fayal. Grain and pulse are 
grown sufficient for the consumption of the population; the 
orchards of Pico are much valued, and large quantities of them 
are disposed of to the Americans and other traders who fre-
frequent Fayal. Among the forest-trees, the cedar and white 
 yew are greatly prized for furniture, nearly as much as 
many other woods abroad on the higher part of the 
ridge, where a large number of sheep are bred for the 
wool, which is worked by the natives into clothing for home 
consumption; goats are still more numerous. Cattle abound, 
and live on a high plane of cultivation. There is 
many plantations of mastic.
The climate is mild, neither the cold of the winter nor 
the heat of the summer being intense, but it is very irregular. 
No decidedly settled weather can be calculated on except 
between the limits of the solstices and the equinoxes. 
Showers of rain are frequent throughout the year, and in 
the winter so violent as to cause constant changes in the face 
of the earth, washing away enormous masses of basaltic 
from the mountains, and depositing them in pluvial deposits on 
the volcanic materials, and leaving the surface of the rocks 
and heights in many places destitute of soil. This island, like 
the other Azores, is subject to incessant gales, which render 
the approach to it dangerous to vessels. Earthquakes are 
very frequent, and four eruptions of the volcano are on record. 
Three of them occurred in the sixteenth century, and the last 
in 1718, which burst from the western side of the peak and 
hollowed out a large crater, and opened a facility of 
volcanic materials. 
The population, which is stated at 30,000, consists of the 
descendants of the Portuguese who settled in the Azores in 
the fifteenth century. They are an inofficious race, and 
are chiefly engaged in fishing and various industries 
around the volcanic rock, called the Isles of Magdelena, and between 
them and Pico is an anchorage in six to eight fathoms. Opposite to 
them is the town of Magdelena Ciapecovella, whence the produce of 
Pico (wine, brandy, fruits) is shipped to Fayal, and where the rich inhabitants of Horta have villas. 
It is not ascertained when Pico was first settled, but per-
haps many years after 1466, when Fayal was occupied by a 
colony of Flemings, who were soon afterwards followed by 
the Portuguese. It was not till the best portion of this island 
had been settled, that the inhabitants passed over to Pico, which 
is so difficult of access. It has always remained in the hands of 
the Portuguese, and the island is a bright red in colour. This species is found 
on dry banks in Great Britain. 

(Babington's Manual of British Botany.)

PIERMARINI, GIUSEPPE, an architect who occupies a 
foremost place among those of Italy during the last 
half of the eighteenth and at the beginning of the present 
century, was born at Foligno, July 18th, 1734. His father 
(Pietro) was a merchant, and intended that Giuseppe should 
apply himself also to business, where he had only to pursue 
the course opened and prepared for him, in order to prosper. 
Nor does he seem to have at all rebelled against paternal 
wishes, except in so far as he thought fit to give his at-
tention more willingly to mathematics and scientific 
pursuits. Having constructed for himself a geographical globe, 20 
Roman palms (about 144 English feet) in diameter, it a-
ttracted much attention among the mathematician Boscovich, who recommended, or rather, enjoined his 
father to send him to Rome to pursue his studies systematically 
under proper instruction.

He was nearly twenty years of age when he went to Rome, 
and, eager to make up for lost time, he applied himself with 
ardor to mathematics and architecture, which last he studied 
first under Poggi, and next under Vanvitelli [vanvitelli, 
P. c.], who conceived a particular regard for him. The 
master was sincerely desirous of bringing his pupil forward, 
and afforded him every opportunity of gaining practical in-
struction, the means for which were abundantly supplied by 
the Count and his friends. Vanvitelli, who lived in a house 
joining to Naples to erect the palace of Caserta, he took Piamerini 
with him as his principal assistant in that extensive work. 
Again, when Vanvitelli was afterwards invited to Milan, by 
the Austrian Government to superintend the works of altering 
and embellishing the palace there, or that now called the 
Palazzo Imperiali, for the Archduke Ferdinand, Piamerini accom-
panied him; and for Piamerini is proved a singularly im-
portant example of the fruitful employment of his 
engineers' and architects' work, the designing and carrying out of all the 
works accomplished by Piamerini (1769), who thus unexpectedly found 
himself established at Milan, the city destined to become the chief 
theatre of his professional labours, with the title of archi-

tect to the archduke, and inspector-general of buildings. Afterwards on the Academy of Fine Arts at the Brera, being established, he was appointed to the professorship of architecture. For thirty years Piermarini was constantly employed at Milan, which is indebted to him not only for most of the principal buildings at that city, but also for the more correct taste which he introduced both by his example and his precepts. He had executed nothing of any note besides the theatre Domiziana (Theatre, Table, P. C., vol. xiv. p. 263), that edifice alone would have secured his professional fame; but he erected, or else altered and improved, so many buildings as greatly to enhance the architectural character of the city. Among the private palaces or mansions by him are the Palazzo Magno, Brera, Lazacorni, Sanazari, Litta, Cusani, and the magnificent and extensive façade of the Palazzo Belgiojoso; also one of the fronts of the architect's palace. Among his public buildings are the Montedel Pèlè, the Monte Napoleone, the Louvre Pî, the Teatro della Canobbiana, and the Porta Orientale, his designs for which were adopted in preference to Cagnola's. [CAGNOLO, P. C. S.]

He likewise conducted many general public improvements, such as several new streets, the Piazza del Tagliamento, and almost the whole of the new quarter called the Contra di S. Redegonda; to which may be added the Public Gardens and their buildings. Nor were his labours confined to Milan, but were extended to the whole of the vast imperial villa at Monza; also of the Villa d'Adda in Cassano, and of the Villa Cusani at Desio, at which last place he improved and completed the church.

Since the Revolution, political changes and the state of public affairs induced him to withdraw altogether from Milan, and retire to his native town Foligno, where he occupied himself with his favourite studies, and formed a valuable collection of books, especially rich in works upon art. There he died, February 18th, 1808. The Academy of the Brera, at Milan, honoured his memory with a monument in the portico of its building.

(See: Vizzioli, in Biografia, &c.)

PIG. [HOG, P. C.; SUTTIE, P. C.]

PIG-NUIT. [BURNUM, P. C. S.]

Pigalle, Jean Baptiste, a celebrated French sculptor, was the son of a carpenter, and was born at Paris in 1714. He was the pupil of Robert le Lorrain and the elder Lemoyne, and studied three years in Rome. On his return to Paris he attracted great notice and obtained a permanent reputation for a statue of Mercury. The king (Louis XV.) purchased the statue, and the Royal Academy of Painting and Sculpture elected Pigalle a member. Louis XV. ordered the sculptor to make a Venus as a companion to this Mercury, which, however, was considered unequal to it, and the king presented them both to Frederick the Great of Prussia: they are still at Sans Souci. Another celebrated work by Pigalle is the statue of Louis XV. at Rieliea; but his masterpiece is the great allegorical group of the Duke of Saxony, Moritz von Sachsen, who commanded the French at Fontenoy, in the church of St. Thomas at Strassburg, commenced, by the order of Louis XV., in 1765, and finished in 1776. It is a great pyramid, which proclaims the glories of the marshal: the idea is singular—the marshal is represented in his own costume, and crowned with laurel, entering a tomb; on one side is Death, as a skeleton; on the other, Hercules mourning; an inscription of France is engraved on the pedestal to restrain the marshal and avert death; a weeping Genius is also in attendance, with an inverted torch: many auxiliary introductions are as necessary. The pedestal is beautifully modelled. It has been several times engraved.

Pigalle was much employed by Madame Pompadour, and his great success is said to be originally owing to her patronage. There is no great work by Pigalle in Paris: the tomb of the Comte d'Harcourt, in Notre Dame, is the principal. Among his smaller works, a figure of a child holding a cage from which a bird has escaped, obtained him great applause. He is considered one of the best sculptors of the eighteenth century, though his taste cannot be called classical. He died in 1765, as Chancellor of the antient Academy of Painting and Sculpture. The bronze equestrian statue of Louis XV., by Bonchard, which was destroyed by the populace in 1792, was finished and put up by Pigalle. [D'Argenville, Vies des fames Architectes et Sculpteurs; W. F. Fould, Künstler am Rhein.]

Pile-engine, in which a heavy mass of iron is raised to a considerable height in the air; the mass being thus allowed to fall by gravity on the head of a pile, the momentum acquired by the descent forces the pile into the ground.

Such an engine is employed in driving piles for the support of the sleepers or horizontal timbers on which are built the piers of bridges, the revetments of the ramparts of fortresses, or any other heavy mass of brick or stone work when the soil is not sufficiently firm to carry the structure. Piles are also thus driven in order to form coffer-dams in rivers, preparatory to the construction of piers or the faces of quays, basins, &c.

A pile-engine generally consists of two pieces of timber, from 20 to 30 feet long, which are braced together and retained in upright positions by means of props; at their lower extremities they are inserted in a horizontal frame constructed with four pieces of timber crossing one another at right angles and resting immediately on the ground, or upon the sides of a large vessel when the piles are to be driven into the bed of a river. The two nearest sides of the upright timbers are covered with sheet-iron in order that while the ram, or driving mass of iron (two of whose opposite sides are grooved or cut to fit the sides of the timbers), may move freely up and down, the shock arising from its impact on the head of the pile may not force it out of its place.

The ram is raised up by means of a rope or chain attached at one end to the barrel of the pile whose supports are bolted to the horizontal frame constituting the base of the machine; the rope or chain passes from thence over a pulley at the top of the two upright timbers; and, descending between them, it is made fast to an apparatus called a monkey, which, by means of forceps or tongs, remains in connection with the ram during the ascent of the latter. The monkey is a block of wood having two opposite sides grooved like those of the frame carrying the forceps, whose form is indicated in the figure: the two curved arms F D, G E, of which it consists, turn freely on a strong pin at A, and, in the descent, their lower extremities D, E, coming in contact with the top B of a staple which is fixed in the top of the ram, open by pressure, far enough to allow that top to enter into the space C; when the weight of the upper parts F, G, cause D, E, to close together under B. Thus, on turning the barrel of the crab, the monkey and the forceps are raised and the ram is drawn up with them.

At the top of the machine are formed two inclined planes, between the surfaces of which, at K H and L M, enter the arms F, G, of the forceps; these closing up in the contracted space near H and L, the extremities D and E open and allow the top B of the staple to escape, by which means the ram, being no longer retained, falls directly on the head of the pile. The weight of the monkey and forceps is sufficient to cause them afterwards to descend, the men ceasing to act at the winch of the crab; and the lower part of the forceps falling on the staple of the ram, the latter becomes engaged with the monkey, when it may be raised up and, subsequently, suffered to fall as before.

In order that the pile may penetrate more easily into the ground, or the bed of the river, its lower part is pointed and shod with iron; and, to prevent the top from splitting by the action of the ram, it is surrounded by an iron hoop. The weight of the ram employed, in large engines, is generally about half a ton.

An ingenious machine for driving piles was invented by M. Vaulouze, and is described by Desaguliers. The power of horses was employed to give motion to a horizontal cylinder, about which a long rope wound round the circumference was raised, and, while the weight was being raised, the cylinder was
PISTANO is the surname of several distinguished artists of Pisa in the thirteenth century, namely, Giunta, Niccola, Giovanni, and Andrea Pisano. Of these two artists, Niccola and Giovanni, some account is given in the Penny Cyclopedia of Art. It appears that they were contemporaries, but there were several Tuscan artists anterior to Cimabue, especially at Sienna and Pisa. [Tuscan School of Painting, p. 119.]

GIUNTA PISANO was one of the principal of these artists, and is the earliest known Tuscan painter; Niccola was a sculptor, and Giunta appears to have preceded him for a time, though not more than a year or two in date. As they were contemporaries, the name of Niccola accordingly takes the lead in the list of celebrated Tuscan artists. Giunta may have been born about 1180 or 1190. He is said to have learned painting about 1210, from some Greek artists, who were then engaged probably at Pisa, a tradition which is disputed by some Italian historians of art, who suppose that Pisa had at that period its native artists. The arts were very active at Pisa, owing to the construction of the cathedral there, which was commenced in 1063. The notice of Giunta in question occurs in an old history of the Basiliac of Assisi, by Peter Anglic, who says, 'Juncta Pisana roditur a Graecis institutis pruni ex Illius artec propheticis circa an. 1210.'

Giunta appears to have attained considerable reputation, for Friar Elia of Cortona, general of the Minoriotes, invited him to leave his monastery to assist him in painting works in the upper church of San Francesco. There are still some remains of the paintings of Giunta in this church, around the window behind the altar. He painted also a Crucifixion in 1210 in St. Agnello Chapel, near the presbytery. Other painters of this time were acquainted with some excellent water-colour medium, for another Crucifixion at Assisi, with other figures, painted upon a wooden cross in the church of San Francesco, by Giotto di Bondone Angeli, by Giunta, is remarkably solid in impasto and unaffected by water; it was painted probably about 1236, and has the following inscription upon it, according to the restoration suggested by Lanzoni: 'Juncta Pisana, Hic assumptus est Giusta di Giustiano to be the name, from the occurrence of this name in an old MS. mentioned by Morroco in his 'Pisna Illustrata.' Other existing works ascribed to Giunta are; a Crucifixion in San Ranieri at Pisa, a picture (a panel) of Saints in the chapel of the Campo Santo, and a Martyrdom of St. Peter in the church of San Francesco at Assisi (it is engraved by Lanzoni in the 'Ettura Pitti' of Lastrici). The Campo Santo was built or commenced by Giovanni Pisano in 1283. [Archaeologia, vol. xxiii. pt. 1.] Giunta was contemporary with Guido di Siena and Bonaventura Berlingieri of Lucca; and all belong to the same school, in style—brilliant compositions, powerful colour in the draperies, emaciated faces, drawn in coarse outlines with hatchings for the shadows, and elongated extremities, even with occasional short thick figures; but their forms are generally well composed and emaciated faces, the meagreness of form however, often had an historical and illustrative significance; as sorrow, resignation, or bodily suffering are almost exclusively the sentiments expressed in early paintings; as we also generally find to be the case in MSS. These peculiarities of style were not much improved until the time of Giotto, and not wholly corrected until Masaccio, two centuries later than Giunta. They were, says Lenti, faults of the times rather than of the men. Mr. W. Y. Otley possessed an old Italian distemper picture of the Crucifixion, which he supposed was a work by Giunta. Vasari has omitted the life of this painter. There is no notice of him later than 1236, but his name occurs in the time of the cathedral, 1281, and that of Andrea Pisano. Andrea Pisano was another early artist of Pisa, but nearly a century later than Giunta and Niccola Pisano. He was born in 1280, was distinguished as architect and sculptor, and is said to be the natural son of his father, who is his first of his age. He is said by Vasari to have imitated the design of Giotto in the Campo Santo. He was invited early to Florence, where he executed several celebrated works. He is said to have had a statue of Pope Boniface VIII. and St. Paul, from designs by Giotto, for the façade of Santa Maria del Fiore; they are now, with other works by Andrea, in the Sintizii garden at Villaccia; the pope is engraved in Cignarai, G. Storia della Scultura; Köhler, Realbiat, 1827; Les Modes à Florence, 1829, and his bust is in the Museo di San Marco in Florence. He died about 1348, and was buried in the church of Pisa.
when young, but smooth when old. The receptacles are compound, axillary, staminal. The flowers white tinged with purple. This plant possesses the peculiar property of intoxicating fish; the bark of the root is the part used. Dr. Hamilton, in a paper read before the Medicinal-Botanical Society of Jamaica, says that the fat from the seeds of this plant is used for the properties and uses of the plant. He says that a preparation of the root is infused into the water containing the fish, which soon rise to the top. They float perfectly insensible, and are easily taken and weighed; they recover on being thrown into pure sea-water, and neither their flavour nor wholesomeness is in any degree impaired. The same gentleman made a series of experiments on himself as to the effect of a larger dose of this preparation. His attack of severe toothache, he took a powerful dose of the tincture, which was succeeded by a profound sleep and entire relief from pain on awakening. As a topical application to cutaneous teeth he found it equally successful, and came to the conclusion that the tincture of the dogwood is more powerful than that of opium. The root-juice is used to poison the arrows with which birds are shot in the Antilles. It is said to be an effective remedy for mange in dogs: it is also reputed to possess tanning qualities. It is one of the best timber-trees in Jamaica; the wood is coarse, heavy, resinous, and almost imperishable, lasting equally well in or out of water; hence it makes a good building material, and is used for a variety of purposes. P. Carthagenensis is a native of Jamaica, Guadaloupe, and Carthagena, on the mountains. It closely resembles the forner species, and is scarcely distinguishable from it. The timber is said to suffer from a disease resembling galls, and consequently the level of the cut-frame-carved by it. Of both this and General Beatham's machinery very full details are given in N. C. L., and in "On Machinery and Manufacturers," in the Encyclopedia Metropolitana. Machines for planing flooring-boards are mentioned under House, P. C. S., p. 54; and under Saw-Mill, P. C., p. 478, is noticed a contrivance for partially planing the surface of boards before they are cut in a square. Immense saving of labour, accompanied with a corresponding improvement in accuracy, has been effected by the application of planing-machines, which are invaluable for iron, other metals, in lieu of the cold chisel and the file, worked by hand. In some instances this has been done on the principle of Bramham's machine, above referred to; but more generally the planing of iron is effected by a stationary cutter, the iron being brought under it by a reciprocating motion. For this purpose it is not usual to employ wide cutting-instruments, as for wood; but a narrow tool, cutting a mere line of the surface at once, is brought into contact with all parts of the surface to be levigated in succession; the motion of the machine is the same as if it were a plane; and in some machines the cutter is raised a little during the return of the carriage after a stroke; but others are so contrived that at the end of each stroke the machine is raised, then lowered and applied to the iron, so as to cut in both directions. A recent account, illustrated with plates, of the admirable metal-planing machinery of Mr. Joseph Clement, of Newington Butts, is given in the forty-ninth volume of the Transactions of the Society of Arts, part i., pp. 157-185.

PLANTA&G;G; a genus of plants, the type of the natural order Plantaginaceae. It has a 4-cleft calyx, a corolla with an ovate tube and a 4-parted limb. The capsules burst transversely; they are from 2 to 4 seeded. P. Coronopus, Buck's-horn Plantain, has linear pinnate leaves, with a slender ovate base, erect; the midrib of the lateral sepals with a ciliated membranous wing; the placenta 4-winged, with one seed in each cell. This species is found in gravelly and sandy places, both north and south of the British isles. It has been eaten as a salad, but it is too bitter and aromatic to be palatable, and these qualities have given it some reputation as an expectorant and vulnerary. Strangewhich accounts for a number of cases of poisoning from the food, and some very improbable cures attributed to its use.

P. maritima has linear grooved dehiscent leaves, convex on the back; the sepals not winged, the tube 2-seeded, the tube of the corolla persistent, the spike cylindrical, the bracts ovate acuminate. It is found on the sea-coast and on high mountains in Great Britain.
PLATANICA PLANTA. (Platanus, C. F.; Platano, C. S.)

PLANTAIN, CHRISTOPHE, was born in 1814, at Mont-Louis, in the French province of Toulouse, one of a family of wealthy parents. He went to Paris in his youth, and worked there some time in a bookbinder's shop, but afterwards went to Caen, in Normandy, where he learned the art of printing. After working in several of the printing-offices of France, and especially at Lyon, he returned to Paris, but the religious disturbances, which commenced about that time, induced him to remove to Flanders, and he is known to have been a master printer at Antwerp in 1550, and held office there until the year 1552. He then returned to Paris, and continued his business as a printer until the year 1600. He died in the year 1601.

PLA. lanceolata is distinguished by its leaves being lanceolate, attenuated at both ends, and rounded at the base, the petiole roughened, the spike ovate or oblong; cylindrical bracts, ovate-acute or oblong-acuminate; the capsule 2-seeded, the seeds lanceolate, the tubes of the capsules acuminate. The root produces long fibres; the neck is clothed with dense wool, and the leaves and seeds with silky hairs. This species was once cultivated as an agricultural plant, but was found to be unprofitable, and has long ceased to be so.

PLAYS is known by its ovate leaves, with short broad pubescent stalks; the sepals are not keeled; the capsules 2-seeded, and each cell containing many seeds. It is found in Great Britain, and has been called 'Way-bred,' from its prevalence on the moors. This plant has a peculiar tendency to grow in the neighbourhood of the abodes of men, and seems as though it followed the migrations of the human species. Thus, although not intentionally conveyed, it has become common all over the world, and is known in some of our settlements to the natives under the name of 'The Englishman's foot'; for with a strange certainty, wherever our countrymen have been, it is to be found. The seeds of this plant are almost entirely found of the seeds of these plants, which are covered with mucus. According to De Candolle the seeds of Plantago arenaria are exported in considerable quantities from Nurnberg and Montpellier to the coast of England, and are supposed to be in demand in the manufacture of muslin. The seeds of P. Isophloia are of a very cooling nature, and with boiling water form a rich mucilage, which is much used in medicine. It is mentioned by numerous writers, and in particular by the authors of the Botanical works. Soda is obtained in Egypt from the ashes of P. squarrosa.

(Babington, Manual of British Botany; Lindley, Vegetable Kingdom; Lindley, Flora Medica; Burnett, Outlines of Botany.)

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antice floras; or only such part of it as remained after decay and the transforming agency of weather had destroyed another and perhaps larger proportion? M. Bronnigtart (though not without some limiting expressions and corrections) generally assumes the fossil floras preserved in the strata as proportionate to the apparent thickness and area of the deposit; and arranging the 601 species of fossil plants in periods of geological succession, as well as in groups of natural affinity, arrives at results which appear in the following table. (We have altered the form of the original, and added the general terms Palaeozic, Mesozoic, &c., in conformity with the views advocated in this work.)

<table>
<thead>
<tr>
<th>Actual period</th>
<th>492</th>
<th>150</th>
<th>150</th>
<th>800</th>
<th>2,000</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fourth period</td>
<td>15*</td>
<td>7</td>
<td>17</td>
<td>25*</td>
<td>100*</td>
</tr>
<tr>
<td>Third period</td>
<td>3</td>
<td>8</td>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
<tr>
<td>Second period</td>
<td>6</td>
<td>3</td>
<td>12</td>
<td>4</td>
<td>12</td>
</tr>
<tr>
<td>First period</td>
<td>4</td>
<td>200</td>
<td>20</td>
<td>16</td>
<td>0</td>
</tr>
</tbody>
</table>

Hence it would appear that vascular Cryptogamia had their greatest predominance in the first (Palaeozic) period; that gymnospermous Phanerogamia acquired their greatest development in the third (Mesozoic) period, while true Monocotyledons and Dicotyledons appear most numerous in the fourth (Cainozic) period, and in it approximated to the proportions now actually observed between them in living nature.

But it is thought by Dr. Lindley (Fossil Flora, vol. iii. p. 5) that the proportions among the several classes and families of plants preserved in the strata may be very different from those which obtained between the plants when living, because only part of the whole living creation of plants could be expected to resist long immersion in water and the many destructive agencies which are at work on vegetable substances, so as to be preserved in the earth. And this view is to a certain extent confirmed by experiments made by Dr. Lindley, for the purpose of ascertaining the relative conservability of plants belonging to different natural families.

For this purpose, on the 21st of March, 1833, he immersed in a large iron tank full of water, 177 specimens of various plants, belonging to all the more remarkable natural orders, taking care, in particular, to include representatives of all those which are either constantly present in the coal-measures or as universally absent. The vessel was kept in the open air, and filled with water as it evaporated, till the 22nd April, 1835. The result of the experiment was then registered in respect of each plant: of the 177 tried, 56 only remained recognisable.

The numbers were thus proportioned in several natural groups:

- Acrocydium
- Dicotyledones
- Dicotyledones apetalae
- Dicotyledones polypetalae
- Dicotyledones monopetalae
- Monocotyledones

Among the Acrocydium the recognizably families were mostly Filices, and Lycopodiaceae, those being frequent in a fossil state. Among the Dicotyledones the recognizable families were numerous, especially in the Coriferae, and these abound in a fossil state. With these exceptions, the Dicotyledones plants tried were, in general, unable to remain for two years in water without being totally decomposed. The Monocotyledones plants were found more capable of resisting the action of water, especially Palmas and Selaginellae, plants which occur as fossils. Ferns exhibited a great power of resisting water, if gathered in a green state, but immersion in water caused their fructification to rot away. If we were completely assured by observation that the circumstances of the experiment were such as the whole of the plants placed in the sediments now hardened around them, were similar to those under which the above-narrated experiments were made, the inferences from the experiments might be relied on for modifying and perfecting a general view of the present vegetation of the globe. But this is not the case; we have no such assurance. On the contrary, in very many cases there is little room for doubt but the plants were speedily enveloped in mud, and, with a lapse of time, were preserved in a fresh state, sometimes in a decomposed state, according to the degree in which they had withstood atmospheric rather than watery agencies, these plants should perhaps be compared to the weeds which cover the surface of some rivers in flood, than to the rotten vegetation at the bottom of stagnant pools. This comparison has, we believe, not yet been made under favourable circumstances, but certainly the flood-transported plants of the Leith rivers are by no means to be considered as a sample of our upland flora, if even they do tolerably represent the vegetation of the river-banks.

Another important question affecting the general inferences to be derived from the study of fossil plants remains to be asked. Did these plants grow in or near to the situations where now they remain buried? The answer must be affirmative in some cases, doubtful in many, and negative in the remainder. It must be affirmative in respect of many cases of Stigmarias, if we admit the stems of this plant, with their articulated leaf-like processes, to be really the roots of trees analogous to Stigmarias and Lepidodendra; and to this, now a prevalent opinion, Dr. Johnstone Brown in his Synopsis Phanerogamiae must be affirmative in respect of the Cycadea plants of the Isle of Purbeck, which remain yet rooted as in their period of life, with the bed of soil in which they grew.

In the case of such as have hollow stems, fern-leaves, and scattered branchings and fragments of stems of Lepidodendra, which abound in the roof of many coal-beds, we cannot doubt that these have been subject to drifting, though it is not easy to determine from what distance or in what direction; as however ever the leaves retain almost universally their figure, expansion, and veins, and are represented by so much of a carbonaceous pellicle as may correspond to their whole mass, and have sometimes preserved their organisation; we may reasonably infer that they have been drifted from far, not to have been long immersed in water.

Many other cases of fossil plants occur, which require us to admit at least the possibility of their having been drifted from great distances. The large broken stems of coniferous wood found in the sandstone of Craigleith, and described by Mr. Witham, may be taken as an example. It suggests, concerning other cases of coniferous wood found in the lois, colites, Wealden and London clay, the idea of a great muddy river flowing through a woody region, and depositing in marshy plains, in estuaries, or in the bed of the ocean. In the eastern sea, the species of these, in the west, we frequently observe the wood to be perforated by Teredinus (London clay).

From the above observations we collect that the large accumulations of organic remains which belong to the coal-measures, represent approximately, though not completely nor exactly, the flora of the period of their deposition at and near the places where they are found; but that single plants or scattered small portions of them may have been derived from remote situations.

Can we, from the catalogues of fossil plants, determine what was the climate in which they flourished during primordial periods? Confining our attention to the British Isles, we remark three great accumulations of fossil plants, in three successive periods. The land vegetation of Palaeozic periods is well represented by the plants of our coal-measures; that of the Mesozoic periods by the plants of the coal-shales of the Yorkshire coast; and that of Cainozic ages is known to us in some particulars by the deposits of Sheppey, rich in seed-vessels.

The most numerous group of fossil plants, in the two former great periods, is certainly the tribe of Ferns, which, with the other vascular Cryptogamia, are known to be most numerous, in comparison of the other races of plants, in countries where the climate is warm and the atmosphere damp. Some of these are Trea-ferns, which remarkably characterize warm though not necessarily very hot climates. These are associated in great abundance large stems, like Cactaceae; others like gigantic Equisetum; others like giant Cryptogamia; others like coniferous hybrids of Lycopodiaceae and Coniferae, and a few Palms; all confirming, by their structural analogies, the conclusion that the climate of the Carboniferous period in the northern zones of Great Britain was wetter than now.
American coal-fields; and thus we find reason to admit a prevalent warm climate in the northern zones of the globe. With these conclusions from the examination of the carboniferous floras, the inferences from the oolitic floras agree sufficiently. Substituting carbonaceous plants only for those, for the lycopod and cactoform forms in these, we have a parallel series of results. And warmth of climate appears still to be indicated by the seed-vessels of Piperacea, &c., which occur in the London clay. In harmony with the data which are here generalized, into the inferences of a warm climate prevailing in the northern zones of the world, even into the Carboniferous periods, is a parallel series of data and inferences derived from the contemplation of the perished races of animals.

Granted, then, a certain high probability that the great masses of fossil plants—those of the coal-formation in particular—grew in an atmosphere warm and damp, in a climate analogous to the shores and islands of the tropics, we shall not wonder if these vegetable accumulations are of considerable extent. But they are of enormous extent; for coal, itself nothing else than plants accumulated, compressed, and transmuted, is of such thickness, even in some of the most valuable beds, as to have absorbed the growth of plants on an equal area for hundreds of centuries, if that growth was after the rain the coal was being formed in temperate, much less in even the most favourable tropical regions. In every natural effect time and force are reciprocally involved: if we suppose the ancient growth of plants to have been more rapid than the modern, the time above alluded to may be conceived to be reduced.

M. Bronniger does so suppose the force of vegetation to have varied and to have diminished towards our days, and he speculates on a cause for this, viz., a change of the constitution of the atmosphere by the gradual diminution of the proportion of its contained carbonic acid. That such a diminution of the carbonic acid of the air may have happened, nothing in physical science forbids: that it is not improbable, the late development of air-breathing animals (in the succession of life on the globe), seems to indicate; and, finally, that it really did happen to some extent at least, after the great period of carboniferous vegetation, may be maintained in a very simple argument. Calculate the quantity of carbonic-acid gas proportioned to the carbon in a given weight of coal: that quantity of the gas, at least, existed in the atmosphere before the fixation of the carbon in the plants which yielded that coal.

The whole quantity of coal actually buried in the earth is of course not known, but that which is known, submitted to this calculation, is enough to leave no doubt that previous to the Carboniferous period the atmosphere must have been loaded with carbonic-acid gas, unless compensating processes, of which we have now no example, were contemporaneously in action. The compensating process now in action is chiefly animal respiration; but we have little or no evidence of the existence of air-breathing terrestrial animals previous to the carboniferous era.

In Morris's Catalogue of British Fossils (published in 1849), occur the names of 254 species of fossil plants, distributed in 107 genera or families. We propose to enumerate these genera and show their geographical distribution so far as relates to the British Islands, according to the classification developed in the Cyclopaedia (PALAEOZOIC STRATA, P. C.; SALIENTIUS SYSTEM, P. C.) and exemplified in the article on Fossils, Fossils, P. C. S.

General Distribution of Fossil Plants.

Tab. I. In British Strata:—

<table>
<thead>
<tr>
<th>Period</th>
<th>Pennsylvania</th>
<th>New-York</th>
<th>Other States</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboniferous</td>
<td>132</td>
<td>125</td>
<td>12</td>
<td>269</td>
</tr>
<tr>
<td>Mesozoic</td>
<td>245</td>
<td></td>
<td></td>
<td>245</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>279</td>
<td></td>
<td></td>
<td>279</td>
</tr>
</tbody>
</table>

For comparison we add M. Gipper's statement of the numbers of plants in corresponding strata obtained from all parts of the globe:—

<table>
<thead>
<tr>
<th>Period</th>
<th>Pennsylvania</th>
<th>New-York</th>
<th>Other States</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboniferous</td>
<td>454</td>
<td></td>
<td></td>
<td>454</td>
</tr>
<tr>
<td>Mesozoic</td>
<td>398</td>
<td></td>
<td></td>
<td>398</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>929</td>
<td></td>
<td></td>
<td>929</td>
</tr>
</tbody>
</table>

In both estimates the Palæozoic Plants are more than equal a number to some of all the other strata. They are chiefly obtained from the coal-measures. Selecting particular groups for consideration, we find some characteristic circumstances of distribution (as in Tab. II.).

Tab. II. Geological distribution of ferns, cycadeids, coniferous, and fusoids in British strata:—

<table>
<thead>
<tr>
<th>Period</th>
<th>Penn.</th>
<th>N. Y.</th>
<th>Other States</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboniferous</td>
<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Mesozoic</td>
<td>51</td>
<td>27</td>
<td>12</td>
<td>86</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>105</td>
<td>0</td>
<td>10</td>
<td>115</td>
</tr>
</tbody>
</table>

Tab. III. Geological distribution of certain genera of plants:—

<table>
<thead>
<tr>
<th>Period</th>
<th>Penn.</th>
<th>N. Y.</th>
<th>Other States</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboniferous</td>
<td>0</td>
<td>0</td>
<td></td>
<td>0</td>
</tr>
<tr>
<td>Mesozoic</td>
<td>13</td>
<td>11</td>
<td>0</td>
<td>24</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>21</td>
<td>22</td>
<td>31</td>
<td>74</td>
</tr>
</tbody>
</table>

General species of the genera of British fossil plants:—

<table>
<thead>
<tr>
<th>Period</th>
<th>Penn.</th>
<th>N. Y.</th>
<th>Other States</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboniferous</td>
<td>2</td>
<td>2</td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Mesozoic</td>
<td>13</td>
<td>3</td>
<td></td>
<td>16</td>
</tr>
<tr>
<td>Paleozoic</td>
<td>3</td>
<td>1</td>
<td></td>
<td>4</td>
</tr>
</tbody>
</table>
PLASTERING is the art of applying plastic adhesive compositions or cements to walls, ceilings, and such other parts of a building as may require a smooth and even surface, to conceal the roughness of brickwork or masonry, or the timber framing of partitions, floors, roofs, and staircases, in such a manner as to admit of colouring, painting, and other modes of decoration. The business of the plasterer also embraces the formation and fixing of ornamental cornices, centrepieces, and other ceiling and similar ornaments. 'No art in the economy of building,' observes Mr. Hosking, in his treatise on 'Building,' in the seventh edition of the 'Encyclopedia Britannica,' 'contributes more to preserve sitting rooms in a state of real neatness and elegance, and no one is less absolutely important, as far as the use and stability of a structure are concerned, than that of the plasterer,' and he further remarks that 'a hole in an application of the most perfect plaster, a damp patch in the wainscoted walls, and boarded or boarded and canvassed ceilings, or naked joints alone, are frequently found in houses of less than a century old, in both this country and on the Continent.'

In the application of stucco or stucco [Stucco, P. C. C., p. 169] to a brick wall, the first thing to be observed is to secure a rough and porous surface to which the composition may adhere readily. In this, the following points should be without the intention of receiving stucco or plaster, the joints are, as mentioned under Building, P. C. S. p. 248, left rough and prominent, instead of being drawn with the trowel, as is done for exposed brickwork; but if they be old, and have had the joints drawn, the mortar must be removed to a small depth, as for repointing, and the surface of the brickwork must be stabbed or picked over to make it rough, and to expose portions of new and porous surface. In applying the plaster, the surface must first be brushed free from dust, then wetted with water, and covered with a first coat of fluid stucco, applied with a coarse bristle-brush, after which, before it is quite dry, the first coat of coarse mortar-like composition is applied. In plastering upon quarter-paritions [Carpentry, P. C. S., p. 299], or upon the surface of timber floors or walls, in forming ceilings, a very different process is adopted. In both of these cases, the trowel is formed to receive the first coat of plaster by nailing to the timber quarterings, or to the joints in the case of a floor, narrow strips of timber, termed stilts, of the same thickness as generally are of fir, though oak is occasionally used, are about an inch wide, from three to five feet long, and either one quarter, three-eighths, or half an inch thick; these several thicknesses being designated respectively single, lath and a half, or double. They are, to ensure greater strength and elasticity, formed by splitting, or rendering, so that they are not perfectly straight, and their surfaces are comparatively rough. They are laid transversely across the joints or other timbers to which they are applied, and nailed to them, frequently with cast-iron nails, in such a manner as to leave a narrow slit or opening between every two adjacent laths. As the work proceeds, a second coat of plaster is necessary to level the under surface of the joints or floor-timbers, by attaching slips of wood, technically called furrings or firrings, before nailing on the laths, in order that a perfect level may be obtained. This is followed, and these laths, which are sometimes required in timber or quarter partitions. In lathing it is important, especially in ceilings, to select laths of uniform thickness, and also to break or vary the joints produced as above to prevent the holes from being a little too near to meet upon a joint or quartering, as much as possible. This done, the first coat of plaster, consisting of what is called coarse stuff, which is a mortar of lime and sand mixed with or without water, with the lime mixed with the sand, and another stuff, a kind of trowel, in such a way as to force the mortar through the narrow openings between the laths, behind which, in consequence of its soft and wet state, it swells in such a way as to bind the laths together, so that it could only be broken away in little bits, and by the application of considerable violence. As the security of the plaster depends upon this keying between and over or behind the laths, the plastering is applied with a great deal of care. In fact, it is evident that the hold must be in some degree interrupted wherever the laths lie in close contact with the joints, quarterings, or battens to which they are nailed, and hence to the importance attached to the proper selection of the timber. Besides the timbers narrow, or, where that cannot be conveniently done, of producing a similar effect by interposing narrow fillets between them and the laths. Projections and pannelled compartments in a plastered surface are provided for by becketting or cradling down the laths to as nearly as may be the required form.

The first coat of plaster being thus laid, the subsequent operations vary considerably according to the nature of the work, and the number of coats it is intended to apply. If it be intended to use only two coats, which, when upon laths, is technically called kind and sett, the first coat, or the laying, is levelled with the trowel, and when sufficiently dry, its surface is scratched up or roughly with a birch-broom, and a thin coat, or set, of finer plaster is laid on and smoothed with the trowel, assisted by a wet breeze and moistureIs much upon the surface of the water, being very useful for the purpose of the operation. When the first coat is laid very roughly, and the faces moist, scrabed by a species of sand blast at the same time, the second coat, the first will occasionally need sprinkling with water to facilitate their perfect union. In better work, where three coats are used, the first coat is laid very roughly, and, while moist, scraped by a species of sand blast as above; the second coat, apart, as deeply and roughly as can be done without laying the laths bare in any place, to make the second coat adhere the better. This first coat may project a quarter or three-eighths of an inch from the laths and it is, in this case, called the pricking-up. When it is so dry as to be thoroughly firm, ledges or margins of plaster, called screeds, are formed at the angles, and at intervals of a few feet across the surface, these being very useful for the purpose of the operation. The projection or level which the finished surface should have, in order that they may form gauges for the rest of the work. When these screeds, which are about six or eight inches wide, are set, the interweaving strakes or laths are filled up flush with them, the plaster being very carefully adjusted to the required surface, by means of flat wooden instruments called floats, made with one or two handles (the latter being called Derby floats), and strans, or edges, or long pieces of wood, carefully placed to a perfectly straight edge, which are moved backwards and forwards over the work in various directions, to test its accuracy. When this second coat is nearly dry, it is sweated over, and a second very thin coat of fine stuff, or second plaster made with very fine white lime, is applied as above described, the hand-float being sometimes employed to perfectly flatten and condense it, and, by the aid of occasional sprinkling of water, it is formed into a very hard surface. In performing the like operations upon a brick or stone wall there are some trifling variations, and the first rough coat is called rendering instead of laying. For minute details in this art, we refer the reader to the articles on the subject in Nicholson's 'Architectural Dictionary,' and to that department of the article 'Building' in the 'Encyclopaedia Britannica' which treats on the duties of the plasterer. Ceilings or fine surfaces that have to be whitened or coloured are finished with putty, which is a fine plaster made of the finest powdered lime. Maccerer, so commonly as to be held in solution by the water, and forming a delicate paste, which is allowed to evaporate until of the proper consistency for working; but surfaces which are to be papered are finished with a somewhat less of water, but still enough, and these are put down while the trowel, without the use of the float upon the last coat.

The various modes of finishing stuccoed or cemented surfaces on the exterior of buildings may be passed over with the remark that they are of the same nature as that which is used in protecting and decayed animal and vegetable matter, in the sand which is mixed with the lime and cement, to which causes of failure may be added the occasional presence of Sagittarian matter in the limestone, and that of the 'three things,' which, Mr. Hosking observes, 'remain quiescent for a long time, if the work were well protected from
PLA

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PLO

access of moisture, which is the grand exciting cause. 'The paint, or distemper wash on the surface,' he adds, 'is generally sufficient to prevent the rain which may beat against a vertical face from penetrating, especially if the work have been properly built and well mortared, and make it shine and compact; but the evil arises from exposure above, and from the numberless horizontal unfastened surfaces which are constantly presented,' which receive and detain the water until the material is wetted, when either the water is set solid in the surface, or, warmth calls the vegetative power of its impurities into action, so that it becomes covered with minute vegetation. Hence he insists on the importance of excluding road-drift, (unless driven off, and they load the shingles from the latter matter), and all mud and clay, from the composition of both plastering mortars and mortars for building, although such materials are often used in mixing what the plasterer terms coarse stuff, under the impression that, so long as it is unctuous and tenacious, its composition is unimportant. He also recommends that care be taken to guard against the effects of wet, not only by providing sufficient shelter, and by frequent painting or distempering, but also by carefully hand-floating and trawelling the upper horizontal surfaces of all projections. Rough-cast is a cheap mode of stuccoing adopted in inferior buildings, when there are good projecting eaves to keep the walls dry, consisting of two coats of coarse lime and hair, covered, as soon as a piece of two or three yards is completed, with a semi-fluid mixture of fine clear gravel and strong lime, andc, and to give it a clustered appearance.

Mouldings and cornices are formed upon a core or foundation, either of brackets and laths, or in some cases in external work, of projecting bricks and tiles. Very trifling projections, such as cornices may be produced by a fragment projecting nails. If large, a layer of comparatively coarse stuff is applied to the foundation, and to this, when dry, is applied the finer composition of which the moulding is to be formed, as nearly as possible in the required shape. The precise form is then given by running or sliding along the cornice, with the aid of guides attached to the wall or ceiling, or both, a mould formed of a thin board, one edge of which is cut up so as to be a perfect counterpart of the profile of the moulding. The quirk or small angles, and in some cases the whole of the acting edge of these moulds, are formed of metal. The composition used for in-door cornices and mouldings is called gauge-stuff, and consists of three-fourths of the putty set in ceiling settings, to one-fourth of calcined gypsum, or plaster of Paris. As the addition of the gypsum cause it to set very quickly, only a small quantity of gauge-stuff must be mixed at once, and the moulding must be frequently sprinkled to keep its surface soft until the shape of the mould is perfectly transferred to it. The mixture of plaster of Paris with sucro for external mouldings should not be too dry, although it enables the workman to produce a sharper and better looking moulding. Such ornaments as cannot be formed by running are cast separately in plaster of Paris, being afterwards placed in the ordinary manner in their places in the ceiling or cornice, either with plaster or some other cement, or when too heavy for such a mode of fixing, by screwing them to wooden cradles fixed to receive them. Mouldings and cornices are usually formed before the final or setting coat is given to the walls and ceilings. Ornaments of paper-mache and some other substances, both lighter and less liable to injury than plaster or any plaster-like composition, have been extensively introduced of late years in internal decoration, and especially for ceilings.

Plasterer's work is measured in feet and inches, and charged by the superficial yard of nine square feet, under separate headings according to the cost of the various materials, and according to certain established rules, for areas or external angles, quirk, mouldings, and other enrichments, and curved work. It is not, however, in a great measure, incombustible, it is to be regretted that its use is not generally so modified as to render it a more important protection to buildings against fire than it commonly is. Under Fine-PROOF BUILDINGS, P. C. S., p. 42, is a table of the general charges made for the attestation of this desirable object.

PLATFORM, for guns, mortars, &c., is a floor of timber or a pavement of stone of a rectangular form which is laid on the planks of a parapet. It is to prevent the wheels of the carriage from sinking. A gun platform has one of its extremities at the foot of the interior slove of the parapet; it is generally 14 or 16 feet long and 10½ or 11 feet broad, and is laid either in a horizontal position, or with a slope of about 6 inches, from the rear down towards the parapet, in order to diminish the recoil of the gun. It consists of five joists or sleepers, each 6 inches square and laid 9 inches apart, and with planks each one foot broad and two inches thick; the planks are sometimes fastened to the sleepers by nails or screws; but in siege batteries, they are kept in their places by a string, which is fastened to the parapet, and ends on each side of the platform, and confined to them by short ropes called rack-lashings, each of which passed under a sleeper and over a riband. By this contrivance the platform may be raised and lowered, and this to a great degree of danger, the noise; and the timbers not being injured by nails or screws, may be removed and re-laid elsewhere as often as it may be necessary to change the position of the battery. Four men accustomed to the service can take up a platform in three minutes, and lay one in an hour.

A mortar platform is 7½ feet long and 6½ feet wide; the planks are three inches thick and rest on sleepers. This platform is placed at such a distance as to face the foot of the parapet towards the rear of the battery, that when discharged at the required elevation, may pass above the crest.

Along the head of every gun-platform is laid a piece of timber called hearth or barker, which, in general, serves to prevent the wheels of the gun-carriage from damaging the interior of the parapet. When the line of aim is oblique to the capital of the parapet, or towards the barker, the carriage, in contact with the wheels of the carriages, in their front, serves to keep the gun in its position.

When a gun is directed against a particular object, as in breaching a wall, the enemy is usually protected by a series of planks each six feet long, ten inches broad, and three inches thick; two of these serve as sleepers, and the other two, being placed across them, serve to support the wheels of the carriage; all the planks are kept in their places by pickets driven in the ground.


PLECTRANTHUS (from βλεκτρον, a cock's spur, and φυτος, a flower, in reference to the corolla being spurred or gibbous above the base), a genus of plants belonging to the natural order Labiata. It has a campanulate 5-toothed calyx in the floriferous state; the teeth equal or the upper one largest. The corolla with an exserted tube; the upper lip from 3- to 4-cleft, the lower one entire, usually longer and concave. There are 4 stamens, dehiscent, didynamous, the lower ones longest; free toothless filaments, ovate uniform anthers. The species are herbs, subshrubs, and shrubs. There are 5 species, the best known being Plectranthus gargano, an easy culture and propagation. Any light rich soil will suit them. The shrubby and perennial species are increased by cuttings. The seeds of the annuals should be raised on a hot-bed, allowed to dry, and are sown in spring in their places in the ceiling or cornice, either with plaster or some other cement, or when too heavy for such a mode of fixing, by screwing them to wooden cradles fixed to receive them. Mouldings and cornices are usually formed before the final or setting coat is given to the walls and ceilings. Ornaments of paper-mache and some other substances, both lighter and less liable to injury than plaster or any plaster-like composition, have been extensively introduced of late years in internal decoration, and especially for ceilings.

Plasterer's work is measured in feet and inches, and charged by the superficial yard of nine square feet, under separate headings according to the cost of the various materials, and according to certain established rules, for areas or external angles, quirk, mouldings, and other enrichments, and curved work.

A gun platform has one of its extremities at the foot of the interior slove of the parapet; it is generally 14 or 16 feet

PLÉNARTY. [UARDE IMPEDTY, P. C.]

PLINUS. [SCHEER P. C.]

PLOOS VAN AMSTEL, CORNELIS, a celebrated Dutch engraver, was born at Amsterdam, in 1726. He is chiefly distinguished for his imitations of the drawings of old masters, of which he possessed one of the best collections known, amounting to 5000 drawings by celebrated Roman, German, French and Dutch masters, from Giotto to his own time. Born of a good and wealthy family, he had every opportunity suitable for improving his taste and advancing his pursuits: he is said to have had a great number of artists in attendance on him for a fourth year; and being acquainted with all the principal collectors of Amsterdam, he commenced making his own valuable collection at a very early age. He had likewise a very valuable collection of engravings, etchings, and old prints. The portraits of Lucas van Leyden, Albert Durers, Golius, Cornelis and Jan Visser, N. Berchem, and especially Rembrandt.

Ploos van Amstel's own works consist chiefly of imitations.
of drawings of old masters, in chalk, washed, and coloured; the coloured imitations were accomplished by printing with several plates. In 1765 he published a collection of forty-six such imitations in various styles, after drawings by Zafleven, A. van de Velde, A. van der Hoeck, A. van Campen, Vandyck, Van Goyen, Gerard Dow, Backhuysen, van der Heyden, A. Bloemart, Golzius, C. Visser, van der Venne, M. Saeuwends, van der Andere, van Mander, Flinck, Bruwer, Miera, Terburg, J. Steen, De Vos, etc.

There are altogether upwards of one hundred imitations of drawings by Ploos van Amstel, and many of these are published in various stages of progress, but very few impressions were ever printed of any of them. Among these are the "Wölken," by J. Weigel in the 'Kunst Katalog,' and in Nagler's 'Künstler Lexicon.' A collection of one hundred of Van Amstel's and some additional similar imitations, with a portrait of Van Amstel, was published by C. Joci, in London, in 1821, royal folio; but only one hundred copies were printed, and at the enormous price of forty guineas per copy.

Ploos van Amstel died at Amsterdam, December 20, 1738, and on March 26, 1800, his valuable collection, with the exception of the etchings of Rembrandt, was sold by auction, and realized the large sum of 109,406 florins.

When Van Amstel's coloured prints first appeared, his countrymen, who believed in "Van Amstel," during the 'tweleve days," using various plates, and he accordingly drew off some impressions in the presence of a deputation of the Dutch Academy of Sciences at Haarlem in 1738, which decided the question in favour of the "tweleve days." (Van Eyden en Vander Willigen, Geschichte der Vaterländische Schilderkunst seit der heft der XVIII. Jahrh. 1816-1842.)

The species of this genus belong to the tribe Festucineae. This tribe is characterized by very short styles, protruded stigmas, and the glumes smaller than the lowest flower. The genus Poa has its glumes rather unequal; the upper glumes with a few crowded hairs below, scariosus at the tip, compressed, keeled, warm; the styles terminal. The species of this genus are very numerous, constituting the commonest weeds that follow the migrations of man; this genus has been used in the same nutritive manner to render them fodder for various animals. Thirteen species of this genus are described by Babington as natives of the British Islands. Of these the most common are the P. annua and P. pratensis. The former is perhaps the commonest of British plants, springing up on every neglected spot around the habitations of man. The latter is known by the name of the smooth-stalked meadow-grass, and is found in most pasture lands. P. nemoralis, the wood meadow-grass, is also a common grass in shady places. Many of the recent genera of Grasses were formerly referred to the genus Poa.

POILLY, FRANÇOIS, a distinguished French engraver, was born in Paris, by the Chateau de Vincennes, and studied under Cloquet and Daret, and studied some time in Rome. He adopted the somewhat hard style of engraving of Bloemaert in direct crosses, in which he was so successful: his drawing was less bold than his execution, and his engraved work is fine and well finished. Though Poilly's style is very laborious, there are about 400 prints which bear his name, in which however he was of course assisted by his pupils. His masterpiece is the print from Mignard's celebrated picture, now lost, of San Carlo Borromæo administering the Sacrament to the Milanese attacked by the Plague. A catalogue of his prints was published by R. Hequet in 1762; it comprises several after Raphael, including the "Vierge au Béarnais, Le Vierge au Linge, the large Holy Family in the Louvre, and other Holy Families by Raphael. Poilly died at Paris in 1693. He was the brother of Jean Baptiste Poilly who were likewise distinguished engravers.

(Waitelet et Lavoisier, Dictionnaire des Arts, &c.; Huber, Manuel des Artistes, &c.)

Poetry in the reign of Scotland, is a process for enforcing payment of a debt, against the property of the debtor. It is divided into 'personal poinding,' and 'poinding of the ground.' The former is the method by which any creditor may seize the horse of his debtor; the latter is peculiar to the holders of real rights over estates belonging to others—as to superiors entitled to feu duties or the holders of real securities entitled to payment of the interest due thereon. This court has power to decree an abstract of the estate, and pay themselves. Personal poinding is the most usual form—it is of very frequent occurrence, and is a rapid and effective process. The procedure was simplified and regulated, and was brought within the authority of the sheriff's local court, by 1 & 2 Vict. c. 114.

POISONING, SECRET. When the knowledge of the nature of mineral, vegetable, and animal compounds was less known than at present, it was not uncommon for individuals to become acquainted with the poisonous properties of various objects, and to keep this a secret for the purpose of exercising a control over the lives of their fellow creatures. The entire ignorance that existed of the means of ascertaining the presence of poisons, or of the symptoms of poisoning, made it impossible for other diseases, gave to persons who had accidentally discovered a poison a great power, and offered a temptation to persons who were supposed to have been secretly poisoned.

Beck in his 'Medical Jurisprudence,' says that 'Theophrastus speaks of a poison prepared from acorns which could be moderated in such a manner as to have effect in two or three years, or at the end of a year or two years; and he also relates that Thrasylas had discovered a method of preparing from other plants a poison which, given in small doses, occasioned an easy but certain death without any pain, and which might be kept back for a long time without causing weakness or corruption. This last poison was much used at Rome about two hundred years before the Christian Era. The laws of the Republic were so strict as to prevent the knowledge of such poisons from becoming general. The punishment for divulging secret knowledge of poisons was severe. A woman named Locusta seems to have been frequently employed for the purpose of administering poisons whose powers were known to herself alone. Locusta was employed by the second Agricola, governor of Britain, to rid their island of the heathen; and also by Nero to poison Britannicus, the son of Claudius and Messalina. (Tacitus, Annal. xii. 66; xiii. 15.)

The poisons used by the Greeks and Romans seem to have chiefly belonged to the vegetable kingdom, such as chamomile obtained, it is supposed, from the sconeite, hemlock, and poppy. One of their animal poisons is said to have been the acrid juice secreted by a species of Tectobrachite molluscs, called the sea-hare. The Apotheon of Hestor of Athens, and the Antiquities of Athens, are charged with the innovation of poison with the agent of the great medical savant. Thus the art of poison appears to have been resorted to for the purpose of committing suicide by means of an unpalatable mixture. They did not seem to be acquainted with mineral poisons.

In modern times secret poisoning has often been carried on to a great extent; although the relation of many of the incriminated persons has been generally by extenuation, and the use of mineral poisons, in the hands of persons in power over many people. At length society was discovered, arrested, and every person put to the torture, and the old president, by name Spara, with four others were publicly hanged. Several of the accused appeared the day after their arrest in one of the finery, not having time to dispose of their finery.

The practice of secret poisoning was carried to a great extent in France about the year 1670. One of the most distinguished agents in this business was Margaret d'Aubray, wife of the Marquis de Briveilleris. She formed an improperly intimate with a villain named Sainte Croix, who taught her the art of poisoning, which she put in practice in order to murder her circumstances. For the period of thirty years she had strength and action of her poisons, she assumed the dress of a nun, and distributed food to the poor, nursed the sick in the Hotel Dieu, and administered to them her poisons. She was condemned by the懂得 this 1676, and left behind her a complete catalogue of all her crimes. The principal poison used by herself and accomplices was poison. The practice of poisoning extended so widely in France that the government thought it necessary in 1675 to institute a court under the title of Chambre de Poison, or Chambre Ardente. The powers of this court were abused, and very shortly after its institution it was suppressed.

Wherever evidence has been left sufficiently point to admit of an inquiry into the nature of these secret poisons, it
has been found that they contain ingredients well-known at the present day. It is only where the sciences of chemistry and medicine are not sufficiently known, or where they are neglected, that we find cases of secret poisoning.

In this country we have recently seen an instance at Hapspurgh in Norfolk, where, from the neglect of inquiry, a man succeeded in poisoning at different times his wife, two grand-children, a son, and several of his friends, during the night, in all about two or three hours, amounting in all to 16 or 18 people, and eventually poison himself without discovery till after his death. Secret poisoning is not more frequent in countries in which the country is well populated than in what is called the nation, but it is not an uncommon phenomenon in uncivilized nations. Dr. James, in his account of the Besouct Expedition, says that the chief, Black Bird, of the Omahas, gained great reputation as a medicine man; his adversaries fell rapidly before his potent spells. His medicine was arsenic, furnished for this purpose by the voyagers of the traders.

(Beckmann, History of Inventions; Beck, Medical Jurisprudence; Adams, Edinburgh Medical and Surgical Journal, vol. 1, 1828.)

POISSON, SIMONE DENIS. We regret that we are unable, from want of materials, to give any account of the private life of this very eminent mathematician. He was born June 21st, 1781, in a humble station, and was admitted to the Ecole Polytechnique in the first year of its establishment. In his history of this school, records the manner in which the young student, at the age of eighteen, attracted the notice of Lagrange by an improvement in the method of demonstrating the theorem which the latter had publicized in a lecture, and announced his intention of abiding by it for the future.

Poison never held any political situation, or took public share in anything but education. In 1829 he was named, by the emperor, director of the Ecole Polytechnique, member of the Council of Public Instruction, and of the Academy of Science. He died April 26th, 1840.

As far as so few words can go, it may be said that the Lhouis of Poison were directed to the introduction of the use of definite integrals in all branches of mathematical science, and the extension of the various branches by their means. There is nothing out of which to make a popular reputation; the successes of Poison are all purely mathematical, and not the mathematician can as much as understand the description of them.

The greater part of the writings of Poison are collected in various periodicals, particularly the Memoirs of the Institute, of the Polytechnic School, of the Academy of Sciences, and the Comptes Rendus, of the Société Mathématique, and the Connaissance des Temps, &c., &c. There is hardly any subject on which they do not treat, and almost always with decided success; electricity, magnetism, heat, geology, are the subjects of investigations, &c., &c., titles each of which suggests to the well-informed mathematician of our time the memory of some ably-written paper by Poison. His object was to leave no branch of physics unexplored by aid of the new and powerful methods of investigation which a school yet more modern than that of Lagrange and Laplace had added to the pure mathematics.

Towards the end of his life he began to collect his scattered memoirs into separate works, with the additions which his subsequent researches had given.

Poison's separate works are — 1. 'Tracté de Mécanique,' Paris, 1811, 2 vols. 8vo.; second edition, Paris, 1833, 3 vols. 8vo. Perhaps this is the best elementary work on a branch of mathematical physics which exists, considered as an introduction to the use of modern analysis. An English student should read it with some of our own writers, who abound in abstract ideas, and who have not the same facility of expression as the 'Theorie Mathematique de la Chaleur,' Paris, 1831, 4to. The principal distinction between this theory and that of Laplace, physically speaking, is the consideration of the variation of density which takes place at the end of the capillary column of fluid. '3. 'Theorie Mathematique de la Chaleur,' Paris 1831, 4to. The data from which Poison starts are derived from the experiments on the nature of heat, made subsequently to the time of Fourier, his object being to illustrate the effects of the capillary condensation by the graphs of the probability of the phenomenon of capillary condensation. '4. 'Oeuvres de M. Arago,' Paris, 1837, 4to. This is, in fact, a treatise on the theory of probabilities, with especial reference to its application to matters of evidence, particularly of the judicial kind. With the exception of a part of the integrals of definite integrals for series, there is little advance, mathematically speaking, upon Laplace; but the practical application of the science is, as before, made in new points of view. Accordingly, Poison has, with great judgment, made the application the heading of the whole work, though it occupies only the quarter of its space. It is said that Poison's second work nearly finished; but it has not yet been published.

POLANISIA (from polis, many, and ares, unequal; stamens numerous and unequal), a genus of plants belonging to the natural family of the Alstroemerieae, native to South America. The stamens are about 10 in number. The silique terete striated, rough with glandular horns, sessile and acuminate. It is native of the East Indies, and is used in Cochín China as a counter-irritant in the same way as sinapisms in Europe, and as a vesicant. The root is used as a vermifuge in the United States of America.

P. grandiflora is a plant beset with glandular hairs; it has trifoliate leaves, elliptic oblong leaflets, from 8 to 12 stamens, oblong siliques narrowed at the base, glandularly muriated and pubescent. It is native of North America, and is employed as a vermifuge.

The species of this genus are all annual plants from tropical countries: the seeds require to be sown in a banded hotbed, and when the plants are of sufficient size they should be planted out in the open ground. The best time for this should not be done before the middle of May. A plant of each should be kept in pots and placed in the greenhouse during the summer in order to secure seeds for next year's sowing. In the hot weather, the summer should prove favourable for ripening in the open border.

(Don, Gardener's Dictionary; Lindley, Flora Medic.) POLARIZATION. (Circular Polarization, F.C.S.; Elliptical Polarization, P.C.S.) POLARIZATION, MOVEABLE, is the name given by Biot to a supposed oscillatory movement of the molecules of polarized light in passing through a plate of doubly refracting crystal; and the hypothesis was proposed in order to account for certain variations of tint observed in the coloured images produced by the ordinary and extraordinary pencils of light. This philosopher assumed that, in permanently polarized light which has been transmitted through a doubly refracting medium, the molecules composing the ordinary pencil or ray have their axes at right angles to those of the molecules which compose the extraordinary pencil, and that M. Arago having observed that the tints of the two images formed after the transmission of a pencil of polarized light through a plate of sulphate of lime varied with the thickness and position of the plate, supposed that the rays were transmitted into the plane of the plate whole at a right angle to the image and the green or violet rays into the other, while at other angles of incidence the contrary phenomena occurred, — he was led to imagine that the polarized pencil, after having entered the plate, does not assume the character of permanently polarized light till it has penetrated to a certain depth, depending on the degree of attractive or repulsive power to which the particles are subject in the medium; and he conceived that, previously to being in that state, the axes of the molecules assume, in a series of alterations, first one and then the other of two particular planes of polarization.

This reasoning then that the phenomena of the colour seen in polarized light are analogous to those of Newton's rings, the ordinary and extraordinary rays giving rise to colours corresponding to those of the rings seen when transmission and reflection occur; the refraction and reflection making the rays from the plate and the incident rays pass through the plates, and reflexions and refractions take place alternately at intervals between the plates which, for homogeneous light of any colour, are comprehended between the terms in the series of distances 0, e, 2e, 3e, &c. In the passage of light through the plate of sulphate of lime, the alternate polarizations take place at intervals equal to those between the terms in a corresponding progression; between these intervals being, however, much greater than the distance of the chief to the second. In the term of 4e the depth represented by e in the crystal, the molecules are conceived to be polarized in the original plane of polarization; between the depths represented by e and 2e they are supposed to be polarized in a plane making with the original
plane of polarization an angle equal to that which the two axes of the biaxial crystal make with each other; within the next depth, that is between 2′ and 3′, they appear to be again polarized in the plane, and so on.

In the same kind of crystal the values of ε are supposed to differ for the different kinds of light, but the limits of the oscillation are the same for all particles whose motions are in the same direction of the incident light. The case when the luminous particles hit the posterior surface of the plate and pass into the air, or enter into any other medium which has not the property of double refraction.

The phenomena presented by mice, beryl, rock-crystal, Iceland spar, and many other crystals, are the same as those presented by sulphate of lime, except with respect to the thickness at which the periodical variations of the tints take place; and this property is generally capable of quantitative determination, but in the hypothesis of a movable polarization: the oscillations, however, do not take place on each side of a line bisecting the angle between the two axes of the biaxial crystal, but on each side of the plane towards which the axes of the particles in the pencil ordinarily refracted by the plate would be turned if those particles had acquired a permanent polarization.

Though Biot's hypothesis of movable polarization has been found capable of explaining most of the phenomena of polarized light, both that in which the incident pencil consists of parallel rays and that in which, the rays being convergent, coloured rings [Polareized Rins, P. C. S.] are produced, yet it is known to be tenable in many respects: The difficulty of the placement of the plane of polarization in plates of crystal may be satisfactorily explained on the principles of the undulatory theory: thus, suppose a polarized ray to be incident perpendicularly on a crystalline plate having its principal section inclined to the plane of primitive polarization in a certain angle; that ray will then be resolved into two, the vibrations of the aetherial molecules in which are respectively performed in the principal section and perpendicular to it. Now, if the thickness of the plate be such as to render the difference between the lengths of the paths of the rays within the crystal equal to an exact number of vibrations, the rays will emerge from the plate in exact accordance: in this case the ordinary and extraordinary rays being polarized in opposite planes they will not destroy each other, and it will be found that the resultant ray, at emergence, is, in respect of intensity and polarization, similar to the incident ray. But if the difference between the lengths of the paths within the crystal be an exact odd multiple of half an oscillation, the waves at their egress will be in discordance, and the resultant ray, at emergence, will be plane polarized in a plane making an angle with the plane of the incident ray equal to twice that at which the principal section of the plate is inclined to the plane of primitive polarization.

POLARIZED RINGS. Between the years 1812 and 1816 several important properties of polarized light were discovered by philosophers in England, France, and Germany, and of these the formation of the coloured rings which are seen when polarized light is transmitted through plates of a doubly refracting crystal, are the most remarkable.

As early as 1811 M. Arago and Biot had observed the variations in the colors of images, which take place when polarized light is transmitted through plates of mica, having made similar observations with agate, mica, and topaz. But the British philosopher vastly extended this branch of optics by his discovery of the systems of rings, which may be seen by both eyes and uni-axial crystals when conical pencils of polarized light are transmitted through them; and his experiments, with those of Young, Wollaston, and Sir John Herschel, in England, have afforded materials for the determination of the laws of the phenomena.

In 1813 Brewster observed circular rings in ruby, emerald, and beryl; in the following year the like were witnessed by Dr. Wollaston in Iceland spar and in 1815 they were seen by M. Biot in France and by Dr. Scheel at Nürnberg.

In order to understand the manner in which the phenomena may be observed, it will be convenient to imagine that the light is polarized by means of a plate of glass either parallel or inclined to the horizon; (a plate of obisism or a pile of glass plates placed one on another may be employed) its posterior surface being blackened; and let the surface of a second plate of glass having its posterior surface also blackened. The former is called the polarizing and the latter the analyzing plate. Let AB be the axis of a slender pencil of light from the clouds or from a lamp surrounded by an unpolished glass, and let it fall on MN at an angle of incidence equal to 58° 47′, the reflected pencil, of which let AB be the axis, will then be polarized in the plane of reflection SAB, which may be called the plane of primitive polarization; and in this state it let it fall on PQ at an angle of incidence of 90° from B let it be reflected to the eye of the observer, suppose at C. The plate PQ should be attached, as in the figure, to the surface of the block FM. PQ; and, for convenience, let the block be a triangular prism of which the plane PD is horizontal and the plane EDQ vertical: the block should be capable of being turned on an axis as BF in the direction of the ray AB produced.

According to the hypothesis of Fresnel the vibrations of the aetherial molecules, when light is polarized, take place perpendicularly to the plane of polarization; therefore, if the plates MN and PQ are disposed as in fig. AB, the course SABC of the ray is in one plane (supposed vertical) and no object is placed in the direction of the pencil AB, the vibrations will take place after reflection from PQ, exactly in the same manner as they take place between the mirrors, and the spectator will have a strong perception of the reflected light. But if PQ be turned on the axis ABC, the perception of the reflected light diminishes; and when the base PD is perpendicular to its first position, in which case the plane SAB and ABC are at right angles to one another, the vibrations are destroyed in consequence of a polarization with respect to the plane ABC, so that the eye at C has no perception of reflected light.

Now, let a thin plate of Iceland spar, ruby, emerald, or other uni-axial crystal cut with parallel surfaces, each perpendicular to the axis of the primitive crystal, be placed as at IK in the direction of the polarized pencil; the former state of the pencil BC will be partially restored; and an eye at C receiving the pencil through a small aperture, there will be seen in the field of view a number of concentric circular rings of different colours, two of which are always visible; one has its branches at right angles to one another. When the phenomenon is observed with common white light polarized as above said, the centre of the field is occupied by a black spot surrounded by a deep blue colour, which gradually declines to whiteness; and, proceeding from the centre outwards, the colour becomes successively a pale yellow, orange and deep red, similar to the first series of Newton's rings. [Colocass or Plates, P. C. S.] The colours in the succeeding rings are arranged in the like order till the rings cease to be perceptible, the cross remaining black.

The phenomena may be observed with equal or greater facility by placing the plate of Iceland spar or other crystals between two plates of tourmaline parallel to each other and to the plate of spar, and observing the lights directly through them; the plate of tourmaline which is farthest from the eye polarizes the light transmitted through it as the plate MN (Fig. 1) polarized it by reflection; and the plate nearest to the eye, having its axis perpendicular to that of the former plate, performs the same office as the analyzing plate PQ, when the surface of the latter is perpendicular to MN. The plates of tourmaline should be cut with their surfaces parallel to planes passing through, or parallel to, the axis of the natural prism; and what is called the axis of the plate is any line drawn on either of its surfaces parallel to the axis of the prism.

In 1813 Dr. Brewster observed that certain crystals, when polarized light was transmitted through them, exhibited two distinct systems of rings; and his first observations were 3 K 2
made on blue tints: a plate of this mineral being placed, as at IK (Fig. 1), and the analyzing plate PQ, being turned round, PD was in a vertical position, that is, till the plane ABC was at right angles to SAB, there appeared a system of rings, apparently elliptical with a rectilinear band quite dark in the direction of the major axis: the colours of the rings being corresponding with those of Newton's rings when seen by refraction. By turning the plate PQ on BF as an axis 90° further, or 180° from the position in the figure, the series of rings appeared with colours seemingly complementary to those of the former series, or, apparently similar to those of Newton's rings seen by transmission. But, turning the plate PQ on an axis BF perpendicular to BF in the plane SAB of primitive polarization, there was found a position in which, by the reflected ray BC, there was seen a system of oval rings similar to the first.

Dr. Brewster observed the like phenomena with plates of mica, nitre, sulphate of lime, &c.; and this led to the discovery that, in such crystals, there are two axes along which there is no double refraction. These are the optic axes of the crystal, or, as they were called by Brewster, axes of no polarization. In different crystals these axes have different inclinations to one another; in micas they make with each other an angle of 45°, in nitre much less; and a plate of crystal cut for the purpose of exhibiting the double system of rings should have its faces cut perpendicular to a line bisecting the angle formed by the optic axes.

Now, if a plate of any bi-axial crystal, as mica, nitre, &c., be placed as at IK in the direction of the polarized ray, and be turned so that one of the optic axes is coincident with that ray; the analyzing plate PQ (Fig. 1) being also turned so that the reflected ray BC may be in a plane at right angles to SAB, there will be seen, about a dark point P (Fig. 3), representing in that which the axis intersects the field of view, a series of oval rings brightly coloured and divided unequally by a dark band MN. A like series of rings about a point corresponding to P, with a dark band like MN passing through that point, will be seen if the plate of crystal be turned so that the other optical axis is in the direction of the polarized ray AB. And when the angle which the optical axes make with one another, or with a perpendicular to the surface of the crystal, is small, as in nitre, both series of rings with their bands may be seen at the same time.

When a plane passing through AB (Fig. 1), and the two optic axes of the crystal are made, by turning the plate of crystal on the ray AB, to coincide with the plane SAB of primitive polarization, the dark curves passing through the two poles points P and P' (Fig. 4) become one straight line MN; the coloured rings come together as in the figure and are crossed by another dark line as M'N' passing through B theore; at right angles to the former. This appearance takes place at every quarter revolution of the crystal plate IK (Fig. 1), on the axis AB; and by actual determination, the coloured rings are found to have the form of lemniscates, whose properties are that the product of two lines drawn from the points P and P' to any point in each curve is constant.

The general equation of Bernoulli's lemniscate is

\[(x^2 + y^2)^{3/2} = a^2(x^2 - y^2)\]

in which \(a\) is equal to half the axis \(a\) of the particular curve, and \(x, y\) are rectangular co-ordinates of any point as \(P\) on the curve, \(B\) the centre being the origin. If BF or BF' be represented by \(a, a'\), and be homogeneous to \(a', a\), the product of two lines as \(PP, PP'\) (not drawn in the figure) will be equal to \(a^2\). But, in order to allow B P to be constant for all the different curves, the equation may be put in the form\(x + y\) being equal to \(a\), in which \(b\) may be of any magnitude whatever from zero to infinity; and from this equation the value of the rectangle \(PP, PP'\) for any one curve is the product \(ab\).

In explaining the phenomena of polarized rings on the undulatory hypothesis, it is assumed that a pencil of polarized light, in its passage along the axis, or along one of the axes of a doubly refracting crystal, ceases to have its ordinary and extraordinary rays polarized in planes at right angles to one another, in consequence of the different degrees of retardation which the waves in the two kinds of rays experience in passing through the crystal, so that they emerge from it in different (those vibrations alone producing a perception of light in the eye, which are perpendicular to the plane of polarization) the angle between that plane of polarization and the plane of primitive polarization being represented by \(a\); a resolved vibration in the ray R, therefore, is produced by the double refraction of the crystal becomes

\[\cos \theta \cos (\theta + a) \sin \frac{2\pi}{\lambda} \frac{a + a'}{\sqrt{2}}\]

and, for the extraordinary pencil,

\[\sin \theta \sin (\theta + a) \sin \frac{2\pi}{\lambda} \frac{a - a'}{\sqrt{2}}\]

Developing \[\sin \frac{2\pi}{\lambda} (a + a')\]

and then adding together the squares of the coefficients of \[\sin \frac{2\pi}{\lambda} \frac{a + a'}{\sqrt{2}}\]

\[\sin \frac{2\pi}{\lambda} \sin \frac{2\pi}{\lambda} \frac{a + a'}{\sqrt{2}}\]

is, by the undulatory theory, an expression for the intensity of light in the image, at a point where the apparent field of view is intersected by a ray whose inclination to the axis AB (Fig. 1) enters into the expression for R; the plane passing through such ray and the axis AB making with the plane of analysis a variable angle equal to \(\theta + a\). Putting \(\psi\) for \(\theta + a\) the above expression has the form

\[\cos \psi \cos (\psi - a) \sin \frac{2\psi}{\lambda} \sin \frac{a + a'}{\sqrt{2}}\]

and, when \(\psi = 90°\), or the planes of polarization for the rays AB and BC are perpendicular to one another, the last expression becomes

\[\sin \frac{a + a'}{\sqrt{2}} \sin \frac{2\psi}{\lambda} \frac{1}{R}\]

where the length \(L\) of a wave differs for the different kinds of light, but the conclusion arrived at being independent of any particular value of \(\lambda\), it follows that all the light vibrates when \(\psi = 90°, 180°\) and \(270°\); consequently there are at the same
time two lines or bands traversing the coloured field of view at right angles to one another, in which the light vanishes; and thus there is produced the appearance of a dark cross, the point of intersection being in the centre of the field, or where the bands traverse one another.

When \( s = 0 \), or the planes of polarization in AB and BC are coincident, the expression (c) becomes

\[
\sigma (t = \sin \phi \sin \phi = \frac{R}{K})
\]

(c) which when \( \phi = 0^\circ, 90^\circ, 180^\circ, \) and \( 270^\circ \) becomes \( \sigma \), a maximum; hence the coloured field of view will be traversed by a white cross with arms at right angles to one another.

If \( s \) have other values, the expression (b) or the density of light will vanish when \( R = 0 \), for \( s = 0, \) \( \alpha = \alpha, \) \( \alpha = 2\alpha, \) &c. But the equivalent of \( R, \) containing, as a multiplier, \( \sin \phi \), (b) being the incidence of a ray on the crystal after diverging from A, or the angle which, as above mentioned, a ray from A makes with the axis AB one giving successively to \( R \) the values \( 0, \) \( 2\alpha, \) &c., it is found that \( s. \) has corresponding values proportional to \( \sqrt[4]{s}, \sqrt[5]{s}, \sqrt[6]{s}, \) &c.; (T being the thickness of the plate of crystal) and since the expression (b) has the same value, and vanishes or is a maximum, for all rays whose angles of incidence in the conical pencil diverging from A are the same, it follows that, about the axis of the field of view, there is the same maximum for all rays whose radius of divergence from A is \( \sqrt{s}, \sqrt[4]{s}, \sqrt[5]{s}, \) &c. The expression (a) is a maximum when \( R = \frac{1}{2} \alpha, \frac{3}{2} \alpha, \frac{5}{2} \alpha, \) &c., or when \( s \) has values proportional to \( \sqrt[4]{s}, \sqrt[5]{s}, \sqrt[6]{s}, \) &c.; and it follows that, about the axis of the field, there is a series of bright rings whose radius have the proportions of \( \sqrt{\alpha}, \sqrt[4]{\alpha}, \sqrt[5]{\alpha}, \) &c.

For the investigation of the phenomena of the rings seen (in Fig. 4) when 1K is a bi-axial crystal having its surfaces cut perpendicular to the plane passing through the axis; and also for the phenomena presented when a plate of crystal, uni-axial or bi-axial, is so cut that the surfaces are not perpendicular to the axis, or to the plane passing through the two axes, see Airy's Tracts (Undulatory Theory). The reader is referred also to Sir David Brewster's Treatise on Optics in the Edinburgh Encyclopedia, and to Sir John Herschel's Fragments on Optics.

**POLLEMONIUM** (polystemon of Dioscorea), a genus of plants, the type of the natural order Pollemiacaeae. It has a campanulate 5-chiefed calyx, a rotary corolla, and a short tube with a 5-sided oral segment. The 5 equal stamens inserted in the throat of the corolla with filaments dilated at the base, bearded in a continuous ring, and nearly closing the throat, and incumbent anthers; the filaments cylindrical, crowned with numerous crumaceas valves, covered with the permanent calyx and many-seeded cells; the seeds oblong, trigonal, and filled with albumen; the radicle twice as long as the cotyledons. The species are erect herbaceous plants, with alternate unequally pinnate leaves; the flowers terminal, bracteated, arranged on panicled corymb, with blue or white corollas. About twelve species have been described, most of them being cultivated and known in our gardens as *Crock* Valley. *F. carafius*, common Greek Verlani, Jacob's Ladder, or Ladder of Heaven, has a glabrous stem, pinnate leaves, ovate lanceolate acuminated leaflets, the segments of the calyx ovate or obtuse, lacinolate, pointed; the petal downy, glandular. The stem is one or two feet high, the leaves alternate, the flowers numerous, bright blue or white, somewhat drooping. It is a native of Europe and America, and is found in Great Britain, but is a rare plant. A great number of varieties have been described. It is a favourite plant in our gardens, and will grow in any common garden soil, and may be readily propagated by dividing the root or by seed. Although it is known as a Pollemium of Dioscorea, it does not appear to agree at all with his description of that plant, and *Frass* refers it to Hypericum olympicum. Great virtues were attributed to the ancient Pollemonium, and these were transferred to the modern plant; but neither the ancient nor modern plant possesses any active medicinal properties. Slight property of Pollemonium is the only property possessed by any of the species of Pollemion.


**POLICE.** In Scotland the larger towns have separate police statutes, by which the management and control of the system is put into the hands of elected commissioners. The Police Acts 1834 & 4 Wm. IV, and the Acts relating to the police of commissioners of powers of management and control, are the same as those of the police of Lorenzo Ghiberti, and assisted him in the celebrated gates of the baptistery of San Giovanni; he became also a famous goldsmith, and was at such as much, or superior, or Florence; Maso Finiguerra was his contemporary and the two brothers generally cooperated in their paintings together; the best of them, says Vasari, is the Martyrdom of St. Sebastian, painted in 1479, in the church de' Servi at Florence. St. Sebastian was painted from nature and is one of the best portraits that had been painted up to that time; it is engraved in the *Etruria Pitrice di Lustrai*.

Antonio is said to have been the first artist who studied the dead subject for the purposes of design. Antonio Pollaioolo was invited to Rome in 1448, after the death of Sistine IV, and of Innocent VIII. In 1449, he made the monuments of Sixtus IV., and of Innocent VIII.; that of Sixtus, in 1493, is now in the church of the Sacrament in St. Peter's; the monument of Innocent is also in St. Peter's. Antonio was also a medalist, and he engraved three or four plates, which are extremely scarce.

(Vasari, Vite dei Pittori, &c., and the notes to Schorn’s German translation; Rubnroh, Italianische Forschung; Cicozrara, Storia della Scultura; Baldinucci, Notizie de Professioni dei Dignaz., &c.)

**POLLAIOLO, SIMONE DEL, or Simon Masi, a distinguished artist, generally called II Cronaca, from his ability in relating stories, was born at Florence in 1454. He was related to Antonio del Pollogajo, and lived with him some time at Rome. He was chiefly distinguished for the Palace of S. Maria della Strozzi, one of the most ancient buildings in Florence; it was commenced in 1489 by Benedetto da Maiano, but was completed by Cronaca, and the great cornice or entablature and the court in the interior are from the designs or engravings of Cronaca. The ironwork and the beautiful lanterns are by Niccolo Grosso, commonly called Caparra, a nickname which was given to him by Lorenzo de’ Medici on account of his always persisting in being paid before he delivered his work: Caparra signifies deposit or advance-money. Grosso was the most celebrated smith of his time.

Cronaca built also the great council-hall for the Signoria of Florence, which was afterwards enlarged and embellished by Vasari; the church of San Miniato al Monte, the presentation necessary for him for a charge in the United Secession Church, of which he became a licentiate in 1827. His principal work, which is in some respects auto-biographical, speaks of the solitude and pastoral simplicity of the scenes in which he passed his youth.
He was a hard student, and appears to have been early en-
dowered with a strong ambition to create for himself a per-
manent name in literature. In his own words—

"This page he tore, and read it a second time, a third, and a fourth, and the eleventh, and the hundredth, and the thousandth, and the millionth page. He was not satisfied with reading; he was determined to conquer, to conquer the whole, and to conquer the world."

Just before he received his licence, he had finished the poem on which his literary reputation rests, "The Course of Time." A work so ambitious, from the hands of a country student, that it was likely to be the first composition of a small body of discourse to be in a position to find a patron among publishers. It happened to be shown to Professor Wilson, of Edinburgh, as a curiosity, and he was astonished to discover in it great poetic power. In deference to his recommendation it was published by Mr. Blackwood, of Edinburgh, and speedily passed through several editions. Its flight of genius was a novelty in the class of evangelical religious literature to which it belonged, and besides pleasing those who are partial to that class of religious literature, it was a boon to many who are inclined to read religious books, but are repelled by their general dryness and insipidity, while it was warmly admired by the literary world. Mr. Pollok's publishers expected him to find a place on a level with Milton. After the novelty of such a phenomenon had however passed off, the book became neglected by purely literary readers; and at this day it may be said that it is hated too highly by the literary world to be insignificantly by the literary world. It is a work of great power, but meagre fancy. It has a considerable amount of sentiment deeply tinged with religious asceticism. Many sentimentalities are spun out or repeated, and the interest frequently flags. The work exhibits a great command of the English language and a power of terse rapid melodious diction. Pollok's mind was evidently imbued with "Paradise Lost," and he followed Milton often to the verge of plagiarism. But the publication of his poem this interesting young man had undermined his constitution by excessive mental labour, and he scarcely lived to see its success. On the recommendation and through the assistance of his friends he was preparing for a journey to Italy. The simplicity in which his family was brought up, may be imagined from the circumstance that his sister, who was to accompany him, obtained a certificate of good character from the minister and elders of her parish, believing that such a testimonial was all the more necessary as they were about to proceed to 'the land of graven images.'

The disease had however made too great progress to admit of his leaving Scotland, and he died near Southampton on 15th September, 1837.

**POLYCARPIDON (from σῶλος, many, and ἀφρος, a seed or fruit: seeds numerous), a genus of plants belonging to the natural order Poly-
carpidae.**

**POLYGNUM (the Greek σωλογνός, 'much-produ-
cive'), a genus of plants belonging to the natural order Poly-
carpidae.**

**P. obtusifolium,** an inhabitant of Europe, the Cape of Good Hope, and Holland; and **P. peploides**, a native of Sicily and France. The seeds of the annual species require only to be sown in the open border in spring. The last species, being perennial, should be grown in a small pot, and placed among other alpine plants.

(The Botanist's Manual; Dictionary of Botany.)

**POLYIODIUM (Fuerst, P. C. S.)**

This plant is an ally of Castanea. It is of British Botany.

**POLYPOGON (from σωλοτρικός, a beard), a genus of grasses belonging to the tribe Agrostideae.**

It has several nearly equal glumes, each furnished with a long seta from just below the emarginate palea. The palea are shorter than the glumes, the outer ones usually curved from below the summit.

**P. monopetalum** has the setae more than twice as long as the rather obtuse glumes. It has a fibrous root, a stem from a foot to foot and a half high, a dense lobed silky panicle often two inches long. The glumes are linear and hairy. It is a very beautiful grass, and a native of Great Britain in salt marshes. It is the *Equisetum* (fox-tail) of Theophrastus, *Hist. Plant.* 7, 17.

**P. littorale** has its setae equalling the acute glumes. The root is somewhat creeping, the stem about a foot high, the panicle close lobed and purplish. The glumes are linear lanceolate. It is a British species and is found in muddy salt marshes.

(Babington's Manual of British Botany.)

**POLYTECHNIC SCHOOL.** This institution was established in London in 1823 to provide extensive and practically useful attainments in pure and applied sciences, originated by the time of the great revolution in France, with one of the representatives of the people, named Fleur (de la Côte d'Or), who being a member of the Committee of Public Safety, and charged with
the duty of superintending the practice of the arts which relate to the service of the country, introduced a plan for the establishment of the school to one of the particular committees which had been appointed by the National Convention. In consequence of a report made by Fourcroy in the name of three united committees, and under the designation of 'École centrale des Travaux publics,' was, by a decree of the Convention, dated 21 Ventose, An II. (Feb. 18, 1794), directed to be formed; and the charge of organizing it was assigned to Moreau, who had been appointed for the post of Gauty Moreau: the first, in particular, was appointed to determine the branches of science which were to constitute the course of study.

The school was to consist of 400 pupils, who were to be admitted on undergoing, satisfactorily, an examination respecting their knowledge of the elements of arithmetic, algebra, and geometry; and, after retaining three years at the institution, during which time they were to be instructed in the higher branches of mechanical science, they were to receive appointments for the posts of civil or military engineers. The course of instruction was divided into two principal branches: the first consisted of mathematical analysis with its applications to geometry and mechanics; and to these were added a course of descriptive geometry [Morgan, P.C.], which was again present before the students. The second branch consisted of chemical and natural philosophy. A building in the Rue Ste. Geneviève was chosen, and the students were divided into classes, each consisting of from 20 to 30: the classes were to be held in a separate hall, during six hours of the day; at certain times, however, they attended lectures in the theatre of the institution; and on two days in every ten they were employed in performing experiments in the chemical laboratory. The pupils were required to execute all drawings relating to the subjects of their studies, and to perform experiments with their own hands, conformably (as is stated in the programme) to the methods followed in the school founded at Metz, for military engineers, and in the school of chemistry and mining at Schenmitz in Hungary.

Such was the origin of an institution of which, with respect to both the branches of instruction to which science has received from so many of its élites, France may be justly proud; and it is worthy of remark that it was formed at a time when some of the most influential men in the government of the country proposed to put all the learned men to death, and to annihilate science as being inimical to the interests of the new republic.

Outlines of the lectures delivered by the professors during the first year were published in 1796 in a volume forming the first of those which constitute the 'Journal de l'École Polytechnique'; and among these are one on stereotomy, by Monge, on architecture by Balian, on fortification by Dopen-heuser, by Nivois, on chemistry by Fourcroy, and on analysis by Prony.

In the course of the same year, 1796, the National Convention decreed that the 'École centrale des Travaux publics' should be opened, and new regulations were made concerning the subjects in which the candidates for admission were to be examined. In mathematics there was required a knowledge of algebra, as far as the resolution of equations of the fourth degrees, with its application to geometry; the summation of series; trigonometry and the properties of conic sections. For the convenience of persons residing in the provinces, the examinations for admission to the school were appointed to be held, at the same time, at towns situated in different parts of France; the municipal authorities of the towns were to be requested to conduct such examinations; and the candidates were to be conducted by duly qualified persons, to be appointed for the purpose. A youth between 16 and 20 years of age only was admissible; and before a candidate was allowed to present himself for examination he was required to exhibit a certificate of good conduct, and of his attachment to republican principles; or, as the sentiment was sometimes expressed, his love of liberty and equality, and hatred of tyrants. A successful candidate was afterwards stationed in a particular military establishment, the Royal Engineers at Paris, on an appointed day: an allowance of money equal to that which was made to a private artillery-man of the first class being assigned to him for his travelling expenses; and, during the time of his residence in the institution, to receive, or, if necessary, to pay, 1200 livres (50l.) yearly. Three years were considered as the time necessary for the completion of the appointed course of study; and a student was not, under any circumstances, to remain at the school longer than four years. Public examinations were to take place at the end of each year; and pupils who should not be found to have attained the requisite proficiency in at least three-fourths of the subjects constituting the prescribed course of education were to be withdrawn from the institution.

In the following year (1796) the National Convention decreed the formation of eight special schools for instruction in matters concerning the different professions which relate to the public service: viz. those of Metz, for Engineers of Metz; those of Arcis, for Engineers of Arcis; those of Châlons; those of Engineers of Metz; those of Ponts et Chaussées, for Bridges and Roads; those of Mines, for Engineers of the mines; those of Marine, for Engineers of the navy; and the students in all these institutions were to receive salaries from the state.

A student desiring of serving the country in any one of the professions for which the special schools were appointed, might, after being two years at the Polytechnic School, become a candidate for that particular profession; and if, after examination, he was found qualified, he was either admitted in the special school or was, on a vacancy occurring, appointed immediately to a post in the department to which he was assigned.

An unsuccessful candidate might remain at the Polytechnic School during the third year; and, at its expiration, he might then present himself as a candidate for the Polytechnic School. Any candidate was to exercise the functions relating to any particular department of the service was also allowed to remain during the third year at the Polytechnic School, in order that he might complete his course of study; and, on the third anniversary of the government of the school being placed under the direction of the minister of the interior; and it was the duty of that minister, under the Executive Directory, to assure himself that the regulations of the school were in force; but the number of students was, at the same time, reduced to 300.

At the end of the first year, 40 young men were taken from the school to serve as officers of engineers; and these officers were to be selected from those who had been admitted to the Polytechnic School as military engineers, and several were appointed to posts in the other special schools.

The necessity of having during teachers for the purpose of preparing the junior pupils, or such as required more detailed instruction than could be afforded by the professors, led, in 1796, to the appointment of assistant preceptors; and these were selected from among the students who, having completed their course of education, were qualified to perform that duty: at the same time, also, the students were made to wear a military uniform. It is remarked that Bonaparte, after his return from the campaigns in Italy, often visited the institution, where he took pleasure in encouraging the youths to prosecute their studies; and when he sailed on the expedition to Egypt he took with him twenty of the most advanced pupils; he was also accompanied, in that expedition, by Monge, who was the principal professor.

In the year 1800 the school was re-formed and the number of students was reduced to 300: the mathematical course was increased; and it was then that a number of new regulations were made concerning the admission of pupils in the armies of the republic during three years should be admissible till they were 26 years of age. The pupils, in general, had then the rank of sergeants of artillery, and their daily pay was 98 cents (46 pence). The military uniform was continued, and on the margin of the buttons were the words 'École polytechnique'; some alterations were made in the mode of conducting the examinations; and a council was appointed for the purpose of attending to the state of the school, and also of suggesting measures for its improvement.

When Bonaparte became emperor, in 1804, the school was again remodelled, and Monge was replaced at its head; it then acquired the title of 'École polytechnique impériale,' and it received an organization completely military. While that extraordinary man governed France the institution may be said to have been in its most honourable period; and the subjects of the course of study were then arranged under thirteen heads, as follow:—Mathematical analysis; mathematical analysis applied to geometry; descriptive geometry; mechanics of fluids; machinery; mechanics of solids; electricity; magnetism; topography; the military art; architecture; drawing of figures and landscapes; grammar and the belles-lettres. At that time also, the following were the subjects a knowledge of which was required of all students: the philosophic, with an explanation of the metrical system. 2. Algebra, containing the resolution of equations of the two first degrees — indeterminate equations of the first degree—the composi-
tion of equations—demonstration of the binomial theorem—
the method of indeterminate divisors, and that of equal
roots of equations. All these are necessary elements of
algebra— and the elimination of unknown quantities in equations
of any degree having two unknown quantities. 3. The
theory of proportion—progressions and logarithms. 4. Ele-
mentary plane trigonometry and the course of descriptive geometry. 6.
Discussion of lines represented
by equations of the first and second degrees with two
unknown quantities—the principal properties of conic sec-
tions. 7. Statics demonstrated synthetically and applied to
the equilibrium of simple machines, as the lever, wheel and
axle, &c. 8. The candidates were also required to translate
part of a Latin author in prose, and give a grammatical ana-
lysis of the sentences. 9. To compare, with scale and
compasses, any geometrical figure which the examiner
might indicate. And 10. To draw and shade, with pencil, a
figure from a given model.

In 1814 the students of the school took a share in the
defence of Paris, and even assisted in serving the guns
directed against the allies. On the restoration of the Bourbon
family, the school was for a time suppressed; but it was
afterwards revived, and it then received the title of "Ecole
Royale Polytechnique," which it still retains. Occasionally
since, unmindful of the submission due to the government
which educates them, the students have, as in 1816 and 1830,
united themselves to their former opposition to the govern-
ment's measures: the acts of insubordination which took place in
1845 appear to have originated merely in a dislike which, for
some reason, the students entertained to a person who had been
present at the examinations; the acts were violent that the king, Louis-Philippe, entirely suppressed the
institution. It has, however, again been revived, and, except
a few of the most culpable, all the students have been
readmitted.

The object of the Polytechnic School is still the same as
at its formation; and the young men are educated for the fol-
lowing branches of the public service: viz., the artillery of
territory; the military engineering; the navy; the marine
technique; the cooperation; the county inquests; the
government of the sea; and the navigation of the seas.

The number of students is now reduced to 200, and the
duration of the course of instruction is two years. Each
student subscribes annually 1000 francs (41l. 13s. 4d.), and
the expense of his clothing is, in addition, about half that
sum. The commander-in-chief of the French armies is the
head of the institution, and all the students are subject to
military law. A candidate for admission must be a native
of France, or a naturalised subject of the kingdom, and he must
be between sixteen and twenty years of age. There are,
however, admitted till the age of twenty-five; but they
cannot receive leave of absence, to prepare themselves for the
examination, till they have been two years with their regi-
mental colleagues.

The government does not engage itself to receive in its
employ all the young men who have been educated at the
school: but such as pass their final examination are allowed,
some of the ranks of merit which were awarded to them by
the jury appointed to decide respecting their qualifications,
to enter one of the branches of the public service as far as
the vacancies will permit. In the gift of the Minister de la
Marine there are four scholarships, in that of the Ministre de l'Intérieur eight, and in that of the Ministre de la
Guerre twelve; and these are for the benefit of youths whose parents
or guardians are unable to pay the subscription. They are
called 'places gratuites,' and each year is equivalent to two
places, which are distributed by the jury, the admittance to
which is decided by a public examination, in which the
students are required to execute a piece of work in one of
the branches of knowledge, as well as a difficult examination
in knowledge of the subject, in which there is an opening
for the young men to show their powers and acquirements.

The 'Journal de l'Ecole Royale Polytechnique' continues
to be published by the 'Conseil d'Instruction,' and it contains
notes on the results of researches relating to the highest
branches of mathematical science. The principal papers were
contributed by La Grange, Monge, La Place, Poisson, Prony,
and other celebrated men; and those of more recent date are
written by the able mathematicians of France, several of
whom have been prizemen of the institution.

PO'MÉE, a section or sub-order of the natural order of
Rossmum. [Rosacea, P. C.] The following is a synopsis
of the genus Rossmum.

1. Cratoxylum (epiherav). Calyx uncoate, 5-cleft;
petals orbicular; ovary 2-5-celled; styles 2-5, glabrous;
the fruit fleshy, ovate, containing a bony putamen. [Crato-
xmlum, P. C.]

2. Raphoelepsia (from man, a needle, and xele, a scale).
The limb of the calyx funnel-shaped, deciduous; the ovary
2-celled, 2-styled; the fruit with a thickened closed disk,
and a papery putamen containing 5 globulous seeds.

3. Chamaemelum (from cham, the ground, and melon, an
apple). Calyx truncate, with 5 little teeth; the petals small,
cease; the stamens 10-15; the ovary 1-celled; the style
5-cleft; the fruit united to the calyx. [Chama-
emelum, P. C.]

4. Photinia (from phairn, shining). Calyx 5-toothed;
petals reflexed; ovary villous, 2-celled; styles 2, glabrous;
fruit 2-celled inclosed in the fleshy calyx.

5. Eriobotrya (from tribe, wool, and phlauros, grape).
Calyx woolly, 5-toothed; petals broad; styles 5, pilose,
inclosed; fruit closed, 5-celled.

6. Cotoneaster. Flowers polygamous; calyx turbinate,
bluntly 5-toothed; petals short; stamina length of the
calyceal teeth; styles glabrous, shorter than the stamens;
2-3 carpels, parietal, inclosed in the calyx with 2 ovules. [Coto-
neaster, P. C. S.]

7. Acorus. Calyx 5-cleft; petals lanceolate; stamens
shorter rather than the calyx; ovary of 10 cells or 5 binate
cells with one solitary ovule in each partition; styles 5,
joined at the base; fruit 3-celled; seeds 5-5; the endocarp
carillaginous; the calyx inclosed in the achene. [Acorus,
P. C. S.]

8. Mesolisla. Calyx 5-cleft; segments foliaceous; petals
nearly orbicular; disk large, filled with honey; styles 2-5,
glabrous; fruit turbinate, open at the apex, 5-celled—
endocarp bony. [Mesolisla, P. C. S.]

9. Oestosmisia (from sericus, a bone, and melon, an apple).
Calyx 5-toothed; petals oblong; styles exerted, the same length
as the stamens, bearded below; ovary 5-celled; cells 1-seeded;
fruit closed, bony. [Oestosmisia, P. C. S.]

10. Pyrus. Calyx uncoate, 5-lobe; petals roundish;
styles usually 5, rarely 2 or 3; fruit closed, 5-celled; cells
carillagious; seeds 2 each in cell. [Pyrus, P. C.]

11. Cynodora. Calyx 5-cleft; petals orbicular; styles 5;
fruit closed, 5-celled; cells carillagious, many-seeded; seeds
covered with pulp.

The species of the genus Raphoelepsia are known by the
same of Indian Hawthorn. They are natives of various
parts of Hindustan and China. There are six species of this
genus, four of which have been cultivated in this country,
and introduced as species of Cratoxylum or Mesolisla.
These are—

P. indica. Common Raphoelepsia, a native of China; R. rubia, a native of Cochinchina; and
R. nolisba, a native of China. All the species are trees in
their native climates, with evergreen crassate cortical
rachises, and flowers in terminal racemes, with white
petals, and red stamens. The species will grow well in a
mixture of sand, loam, and peat. R. Indica, in British
gardens, is an evergreen shrub blossoming from February to
August, and a large number of the species have thus
been awarded to us for many years. It is probable all the species would bear our winters if
planted against a south wall, and covered with mats in
severe weather.

The genus Chamaemelum was constructed by Lindley for a
single species, C. coriaces, which is found in the island
of Madeira. It grows on the sea-cliffs to the east of Funchal, about a mile from the town on the coast to	
Canico.

The species of the genus P. serrulata are evergreen trees with
undivided coriaceous serrated or entire leaves, and flowers in
terminal corymbose panicles, followed by small fruit. They require the same treatment as the species of Cratoxylum,
and are eminently ornamental.

P. serrulata has oblong acute serrated leaves, and is a
native of Japan and China. It has been long cultivated
in Great Britain as a standard in the open air, in warm
situations.

R. indica, in our warmest

1. Fit associates for it against a wall. Pho-
tinia arbutifolia, Cratoxylum glaucum, C. mexicana, Raphoelepsia
indica, and Eriobotrya japonica. Three other species, P. arborea, P. integrifolia, P. dubia,
have been cultivated in this country. There are four
or five other species described, natives of Asia, which might
probably be cultivated with success.

The species of Eriobotrya are less hardy than those of the
last genus. They are small trees with tomentose branches, broad simply serrated leaves, which are woolly beneath, with woolly compound terminal racemes of flowers, and subulate deciduous bracts. *E. japonica* is the common Loquat. It has broad elliptic serrated rather wrinkled leaves, tapering at the base and usually toothed at the apex. The flower is a small tree a height of from 10 to 20 feet, and is a native of China and Japan. The fruit is of a middling size, pear-shaped, yellow, downy, and disposed in large pendulous clusters. The leaves of the plant resemble the apple, and are said to be equally good with that of the mango. Lord Bagon has grown this tree at Blithfield, where it bears fruit, which is represented as having a flavour equal to that which is produced in Cyprus. It is at its best in the months of July, August, and September, and kept in a very warm house during the rest of the year. There are four other species of *Loquat*, but none have been introduced into cultivation in this country. Amelanchier is another genus separated by Lindley from the old genus *Amelanchier*. The species are small trees, natives of Europe and North America, with simple serrated deciduous leaves, white racemose flowers, and linear-lanceolate deciduous bracts. They are cultivated in British gardens on account of their early white showy flowers, their fruit which ripens in June, and the deep yellow red which their vegetation assumes in autumn. *A. vulgaris*, the common Amelanchier, has roundish-ovate bluish leaves, downy beneath, glabrous afterwards; the fruit is of a purplish colour, and is ripe in June. It is also found on rocky banks in many parts of the continent of Europe. It has been in cultivation in England since the year 1896. *A. betulina*, the Grape-Tree, has oblong-elliptical or ovate, acute, acuminate leaves, glabrous; the fruit is a dark yellow, and is ripe in August. It is also found in many parts of the continent of Europe. It has been in cultivation in England since the year 1896. The *Pyura elegans* of Sir J. E. Smith has been made into the genus *Osteomeles* by Lindley. At present this is the only known species. It is a shrub, native of the Sandwich Islands, with pinnate leaves and a small fruit crowned by the styles and calyx. The species of *Cydonia* yield the fruit called the Quince. *Cydonia vulgaris*, or Quince, P. C. C. Independently of this recommendation, they are very useful as stocks for other species, which are desirable for the ornamental plantation. *C. vulgaris* grows in the countries of the eastern world in the wild state, and is very common in cultivation. It has ovate leaves, oblong at the base, entire, tomentose beneath, and in a short time becomes glabrous. The flowers are small, white, and red, succeeded by a large globular or pear-shaped yellow fruit. It is at the present day apparently indigenous in the south of France, Germany, and the banks of the Danube, and it has been cultivated from time immemorial. The *Cydonia orientalis*, *Hort. Plant. lib. 2, cap. 3*, is the variety *Cydonia vulgaris* molliformis of modern botanists, whilst the *spppns* mentioned in the same place is the *C. c. pyriformis*. In cultivation the quince offers a moist but free soil well drained. The finest specimens in this country are found in orchards near ponds. The best mode of propagating it is by layers. It may also be grown from cuttings planted in the autumn. The quince is a variety of the first species. Two other species, *C. sinensis* and *C. Japonica*, the Chinese and Japanese Quince, are often cultivated in this country. They require the same general treatment as the foregoing. The *Cydonia* is a variety of the first species. There is one other species of *Cydonia*, *C. Simboli-thina*, a native of Nepal, where it is called *Simboli-thina* or *Blue*, but it has not been introduced into this country. (From *The Vegetable Kingdom*; London, Arberetum et Fruticetum Britannicum.)

PONTEDERA CEE, *a natural order of plants belonging to the chief of Etiologra*... It has a 6-parted tubular coloured perianth, more or less irregular, with a distinct calyx. The stamens arising from the calyx 6 or 8 opposite the lobes of the calyx, and the anthers turned inwards, opening lengthwise. The ovary is free, more or less completely, 3-celled, many-seeded; one style, the stigma simple. The capsule 3-celled, occasionally dehiscent at the mouth. The plant is paludal and often submerged. The leaves are ovate or oblong, digitate, or divided. The flowers are usually or solitary in spikes or umbels, spathaceous; frequently blue, sometimes yellow, red, or purple. The sepals and petals are distinguished by the divisions of their flowers being rolled inwards after flowering, to which may be added mealy albumen and an indefinite number of seeds. They are natives exclusively of North and South America, the East Indies and tropical Africa. Very little is known of their uses. Some of the species are employed by the native Indian practitioners in liver complaints and diseases of the stomach. Rubbed down in butter and drank, they are said to remove redness of the eyes; powdered and mixed with sugar, to relieve asthma; and when chewed, to remove tooth-ache; bruised with oil, some are administered in fever and some eaten as pot-herbs.

(Lindley, *Vegetable Kingdom*.)

PONTIUS, P. A. L., a celebrated engraver, was born at Antwerp in 1588, and died at Florence in 1658. He engraved the plate of the dead Christ in the *Iliad* of Homer, and the figures of the *Antiquities of the Jews* of Pliny. He was employed by other artists, such as Abraham Blooteling, in 1603. The date of his death appears not to be known: the *Slaugther of the Innocents*, after Rubens, one of his principal works, is dated 1653. Pontius was the name of very ancient and illustrious Roman families, and he is chiefly distinguished for his excellent prints after Rubens, which he executed under that great painter's inspection. He engraved also a celebrated set of portraits after Vandyck, including those of many of the most distinguished Flemish painters.

PONTORMO, JACOPO DA, or Jacopo Carucci, a distinguished Florentine painter, was born at Pontormo, in 1494, and died at Florence in 1557. He was the pupil of Leonardo da Vinci, and he studied under Alberti, Bindoni, Piero di Cosimo, and Andrea del Sarto. He painted for some time in a similar style to Andrea, and was that painter's rival; but he frequently changed his manner, and three distinct styles are ascribed to him, progressively inferior; the last imitated from the works of Albert Dürer. Towards the close of his life he spent eleven years in painting some frescoes of the Deluge and the Last Judgment in the church of San Lorenzo, in the manner of the imitators of Michael Angelo, but they have long since been whitewashed over.

(Vasari, *Vie de' Pitori*, &c.; Lani, *Storia Pittorica*, &c.)

POOR LAWS, SCOTLAND. The foundation of the Old Poor Law of Scotland was the act of parliament, 1579, c. 74, which in its principal respect resembled the celebrated English statute of the fourteenth of Elizabeth, passed a few years earlier, as to have been considered a mere adaptation from it. The Scottish act, however, fell short of the English in the one important particular of not providing for the care of the able-bodied. By this old act, a settlement was acquired by birth, and once established could not be changed unless by a seven years' industrial residence in another parish. By the act of 1675, c. 18, this period was shortened to three years. The method of administering the law, which arose partly out of the terms of the old acts, partly out of custom, and partly from directions given to the assessors of the poor, and, in the judgments of the courts, was as follows:—In the rural parishes, the 'kirk sessions,' or lowest ecclesiastical judicatures, consisting of the parish clergyman and certain elders, shared the management with the 'bishops,' or refusal of orders, but it became customary for the latter body to interest themselves solely in the voting and levyng of the rate, leaving its distribution and the management of the poor to the former. This plan became the basis on which the assessment and management lay with the corporate authorities. The funds for the relief of the poor were of two kinds, the collections at church doors, along with certain fees and exchequerary bequests, constituted the revenue assessed rates on the parish, or a substitute voluntarily paid instead of an assessment, the other. Of the sums collected at the church doors only a half went to the regular relief of...
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those legally entitled to relief; the other became a fund for general charitable purposes at the command of the kirk session. The former was, on paper, a fund, and the regular practice came to be, that if the miscellaneous sources were insufficient for the relief of the poor, the heritors and session in a country parish, or the magistrates in a town parish, might levy a rate on the property of the particular vestry or kirk session chiefly interested to agree to a 'voluntary assessment,' for the purpose of postponing the imposition of a fixed legal rate. When an assessment was imposed, it became a rule that onehalf of the money should be paid in land, in respect of their land; the other on householders, in respect of their 'means and substance,' or their incomes so far as not derived from land. The adjustment of the rating was the greatest difficulty and several different parishes followed very distinct methods in practice.

For a considerable period, the Scottish system was very favourably received by political economists, who saw the country in a comparatively sound moral condition, with a pari-munimous poor law, while the lavish system of England seemed to promote profligacy and idleness. But from the time when these systems were first promulgated to the completion of the great change of the English poor law, a vast internal alteration had taken place in the social economy of Scotland. The comparative low rate of wages, attracting manufacturing capital from England, had caused a more than average migration of the rural labourers to the manufacturing districts, and a peculiarly rapid increase of the city population. It was found that with these complicated materials, the almost uncontrolled facilities of the national system where each member watched over the interests and the conduct of his neighbour, was incapable of grappling. It was found that even for poor country districts the system was unsuitable, because the greater part of the funds of the system in production, the administrators were compelled by the voice of public opinion to become more liberal in their dispensations, while the managers of the country parishes not subject to the same influence, kept down their allowances, and thus gave the poor an inducement to endeavour to obtain a settlement by three years' industrial residence in the cities. Dr. Chalmers was the great champion of the old system. With the assistance of some enthusiastic followers, he organised the administration of a parish in the poorer parts of Glasgow, as a demonstration of the efficiency of which the system was capable. It was a very pleasing picture, but the public soon felt that the success with which one energetic individual and his enthusiastic followers might voluntarily perform the duties generally exacted by legal compulsion, was no sufficient ground for believing that the rest of the community can be at all times and in all places dependent upon the performance of onerous public services without the coercion of law.

The public were first awakened to the imperfections of the Scottish poor law by Dr. W. P. Alston, a physician in Edinburg and one of the presidents of the practical societies in that city. Having frequently administered professional services to the poorer classes, he showed from his own experience that the utter inadequacy of the provision afforded to those who worked, was the chief cause of the necessity of such aid. It was a common experience that the poor, who had done work, were reduced to want, and was an extensive cause of disease, vice, and misery. The city population speedily answered to this appeal, and associations were formed, and inquiries made in various directions. It was shown that the amount expended on the relief of the poor in Scotland amounted to little more than a sixth part of the sum 'distributed throughout an equal population in England and the U.S.A.' on the poor law.

In England, the expense of supporting the poor amounted to 6s. 10d. per head of the population; in Scotland, to 1s. 2d.

In some of the Highland parishes, whence the most destitute objects emigrated over the rest of the country, the allowances were ludicrously small; and a Report made to the General Assembly of the Church of Scotland in 1830, enumerated instances where sums averaging from 3s. to 1s. yearly were solemnly awarded to deal with people, as the poor law made for their wants. In the mean time, the discussion of these matters had a tendency gradually to increase the amount of the provision for the poor. The practice of distributing some considerable sums by the kirk session to parliament in 1843 shows that between 1826 and 1841 the sums raised by assessment had increased from 89,101l. to 228,824l.; while the sums raised by voluntary assessment had increased from 1,195l. to 1,296l. Of the institutions in Scotland they were appointed to inquire into the whole state of the subject, and after hearing much evidence, they presented a Report, accompanied by a voluminous appendix, in 1843. The amendments proposed in this Report were supposed to be of somewhat considerable importance, on account of the country expressed dissatisfaction with them; and in 1845 a measure was passed embodying alterations considerably more extensive.

By this act, 8 & 9 Vict. c. 63, a board of supervision is appointed to replace the old local board, the members connected with municipal bodies and the administration of justice in Scotland, with one salaried member, who gives constant personal attendance. The office of the board is in Edinburgh. This board is endowed with all the powers of the local boards and is not, and the system of relief is administered. The board has, however, no directory or prohibitory control over the proceedings of the local boards. In some of these bodies, some of the provisions of the act. In the rural parishes where there is an assessment, the local board is to consist of landowners to the extent of 20£. annual value, the kirk session, and certain elected representatives of the other rate-payers, according to the number fixed by the board of supervision. In city parishes, the boards are each to consist of four persons named by the magistrates, not exceeding four from each kirk session in the city, and certain elected persons according to a number and qualification fixed by the board of supervision. In parishes where there is no assessment the management is to continue under the old laws. The board may provide machinery for levying or exacting a rate for the poor, unless in those parishes where the persons more immediately concerned agree to such a measure. It is held, however, that the board of supervision has no power of interfering with the funds from the respective parochial authorities the relief which they are entitled to put necessary to pay the collectors of the funds to the disposal of the distributors of relief, and this can only be as a result of the act. It is important to note that persons apply for relief, it is provided that, though they have no settlement, if the claim would be in the case of their having one in the parish where it is made, it is necessary that they be assessed. They are thus enabled to add to the funds. When relief is refused, the applicant may apply to the sheriff, who may grant an order for temporary relief, and then hear parties, and decide whether the applicant is or is not entitled to relief. In this form, however, neither the sheriff nor any other judge can decide on the adequacy of relief. The initial step to any judicial appeal against the amount of the relief afforded is, by an application to the board of supervision, and on that body reporting its concurrence, the applicant is placed on the poor-roll of the court of session, where he has the privilege of the question being discussed gratis. By this act, provision is made for medical attendance and medicines, being part of the system of pauper relief, and for the education of pauper children. It is provided, that for the purposes of the act, parishes may be united into 'combinations.' By a special clause, nothing in the act is to be construed as excluding any that may be established by the state of doubt in which it stood before the passing of the act. Men deserting their wives and children are made liable to punishment as vagrants, a provision which it is hoped may curtail the number of those who resort to a laudable and the law of Scotland—the absence of any means by which deserted wives can make effectual claims on their husbands for sustenance to themselves and their children, without a regular action in the court of session. By the new act, a new and more specific mode of ascertaining the amount of the assessment between landed and other property has been attempted to be established, and this provision is already full of distressing discretion of property, and for the time necessary to acquire an industrial settlement is increased from three to five years.

POPLARS, POPLUS. [Salicaceae, P. C.]

PORCELLIUM, a fossil genus of Heteropodinae. Mollusca allied to Bellerophon. From the mountain limestone. (Leviellis.)

PORES OF PLANTS. [Stomata, P. C.]

POROSITY is the condition of natural bodies which consist in the discontinuity of their molecules, the intervals between these being pores (from δορα, a passage). Porosity is a property common to all the bodies of nature, at least within the cavity of any one of them, and a body is said to one another. In some, as sponge and coral, the pores are visible to the eye, and in others they may be rendered so by the aid of a microscope. In bodies whose pores are not thus enlarged, the porosity is proved by various circumstances. Thus water or mercury being contained in an open vessel of wood over the exhausted
receiver of an air-pump will, by the pressure of the atmosphere, be forced through the wood and fall from thence in a shower; liquids also are frequently filtered by being made to pass through the pores of paper; and in the florentine experiment, for determining whether or not water is compounded with the waters of rivers and seas. In the latter case the power of the vessel of gold in which it was contained. Again, the porosity of bodies is inferred from their elasticity and the sounds which are heard when the molecules are in a state of vibration: the sounds in air are not in part negligible but it is generally observed that the bodies prove it from the fact that the particles of light pass through them, or that the vibrations of an animal fluid take place without doing any harm. The second and third cases this demand even to sketch out his designs, done by young Ker Porter, hardly then in his twentieth year. This picture was burnt in the fire which consumed a friend's warehouse where the painter deposited it before he left England to go to Russia; but the sketches exist, and were sold at the sale of Sir Robert's effects in 1843. Another great battle was the Siege of Acre, exhibited also in the Lyceum Room in 1801: he published at the same time a book entitled 'The Siege of Acre, chiefly intended as a companion to the great historical picture painted by Robert Ker Porter, now exhibiting at the Lyceum, 1801;' it contains spirited etchings of the picture. These were followed by a series of other works, in which he painted the Battle of Alexander the Great, which he presented to the City of London, and it is still in the possession of the corporation: it was hung up in the Guildhall a few years ago. He also painted pictures of the Battle of Salamis, and the Battle of Actium, which was arranged; but some ministerial differences caused him to leave Russia; in the year 1811, however, the marriage took place, and the princess survived him. He painted at St. Petersburg, on one of the plans of the city, the Battle of St. Petersburg, in 1813, and in 1815 painted the Battle of Borodino, in which he occupied his extensive travels in Asia, of which he published a detailed account in 1821-22:—"Travels in Georgia, Persia, Armenia, Ancient Babylonia, &c., during the years 1817-18-19-20." The Costume of Greece, Persian Costumes, Antiquities, &c., 2 vols. 4to. In this work are many excellent designs in outline from the fine characteristic ancient sculptures of Naxos, Samos, Rhodos, &c. Some of the figures of these sculptures, which in Le Brun's time (1704) were mere headless trunks, are represented by Niebuhr ('Reisebeschreibung,' &c., ii. 180), half a century afterwards, with eyes and noses complete, but executed with out the least skill whatever; the representations of Sir John Chardin are not much better.

In 1832 Sir Robert Ker Porter was created Knight Commander of the Order of St. John of Jerusalem. He died at Paris on the 13th of May, aged 67, and was interred at Nice on the 15th. He was appointed a few years before British consul at Venezuela, where he resided at Caracas until 1841, and he painted while there three sacred pictures, which were his last principal works; he also attempted several separate works, and was induced by his evidence of talent to take him to London, in order that he might have the opportunity of instruction in the Royal Academy. His mother took him, in about 1790, to Westminster, where he procured the present picture, but hard by was so much struck with the spirit of the boy's sketches, that he procured his admission into the academy, and predicted his certain success with confidence. Sir Robert's confidence in his own sound judgment was so much the same as any other. In 1793 he had already evinced such extraordinary progress as to receive a commission to paint an altar piece for Shoreditch church. In 1794 he presented an altar-piece of Christ alloying the Storm to the Roman Catholic chapel at Portsea; and in 1798 another of St. John preaching in the Wilderness, to St. John's College, Cambridge. His most extraordinary productions, however, were his great battle-pieces, displayed in the main hall of the college. Between the years 1795 and 1800 he painted the storming of Seringapatam. He is said to have been only six weeks in painting the picture, and yet the execution was so true to life, that the portraits of the principal actors painted by a number of the academicians then occupied in preparing the exhibition, and said, 'he had just looked on what he must consider a wonder in the art: a work of such dimensions, finished through and from that period he was called upon by the demand even to sketch out his designs, done by young Ker Porter, hardly then in his twentieth year. This picture was burnt in the fire which consumed a friend's warehouse where the painter deposited it before he left England to go to Russia; but the sketches exist, and were sold at the sale of Sir Robert's effects in 1843. Another great battle was the Siege of Acre, exhibited also in the Lyceum Room in 1801: he published at the same time a book entitled 'The Siege of Acre, chiefly intended as a companion to the great historical picture painted by Robert Ker Porter, now exhibiting at the Lyceum, 1801;' it contains spirited etchings of the picture. These were followed by a series of other works, in which he painted the Battle of Alexander the Great, which he presented to the City of London, and it is still in the possession of the corporation: it was hung up in the Guildhall a few years ago. He also painted pictures of the Battle of Salamis, and the Battle of Actium, which was arranged; but some ministerial differences caused him to leave Russia; in the year 1811, however, the marriage took place, and the princess survived him. He painted at St. Petersburg, on one of the plans of the city, the Battle of St. Petersburg, in 1813, and in 1815 painted the Battle of Borodino, in which he occupied his extensive travels in Asia, of which he published a detailed account in 1821-22:—"Travels in Georgia, Persia, Armenia, Ancient Babylonia, &c., during the years 1817-18-19-20." The Costume of Greece, Persian Costumes, Antiquities, &c., 2 vols. 4to. In this work are many excellent designs in outline from the fine characteristic ancient sculptures of Naxos, Samos, Rhodos, &c. Some of the figures of these sculptures, which in Le Brun's time (1704) were mere headless trunks, are represented by Niebuhr ('Reisebeschreibung,' &c., ii. 180), half a century afterwards, with eyes and noses complete, but executed with out the least skill whatever; the representations of Sir John Chardin are not much better.

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made: for his constitution, then insued to the warm climate of Venesuela. Sir Robert himself, in a letter dated only the 6th of May, announced his intention to his brother, Dr. Porter, of Bristol, of embarking immediately for England; on the following day, however, a letter was written by the chaplain of the British embassy announcing his death by apoplexy. The body was put in an extract of opium, but, Sir Walter] and the night of the 23rd, Sir Robert went to court to pay his respects to the emperor, and afterwards made two or three visits to private friends: on arriving at his house about three o’clock in the afternoon, Sir Robert, in opening the glass of the carriage, perceived that his master was holding himself in, and that he moved to the door with much difficulty; but before he could descend the steps he fell down from the effects of an apoplectic fit, and the carriage was hurried up town. The water, soon after which consciousness ceased, and he expired at eight o’clock this morning (May 4, 1842), in his sixty-second year. His effects were publicly sold in London, in March, 1843.

(Athenaeum, 1842-43, and the Artist’s Works.)

PORTFIRE is a composition consisting of saltpetre, sulphur, and mealed gunpowder, mixed together by being rubbed between the hands, and, after being passed through hair-sieves, moistened with spirits of wine: the mixture is then rammed or driven into a paper case of a cylindrical or conical form, and less than an inch in diameter. A piece of portfire sixteen-teen or twenty times as large as this had been kept up in the same manner for about fifteen months.

It is sometimes used as a match for firing artillery, in which case the saltpetre, sulphur, and powder are in the proportion of 6, 2, and 1, respectively. This powder is frequently employed in breakout, or in blasting rocks, when the proportions of the like ingredients are as 7, 2, and 8, respectively. For these last purposes the portfire is attached at the extremity of a long stick, and passed in the shaft bored in the rock or object to be blasted; and the fire is applied to it by a match.

POSITONOMYA. [POSITONIA, P. C.]

POSSIBILIO FACTRIS. [DESCRIPT, P. C.]

POST HOBSES. [POSTING, P. C.]

POTAMOGETON (from ὑγρός, a river, and the termination τέρπειν, which probably means ‘produced’), a genus of plants belonging to the Endogenae class, and the natural order Potamone. It has a perfect flower, a 4-parted perianth, 4 sessile anthers opposite to the divisions of the perianth, 4 ovaries, and 4 drupes or nuts. The species are water-plants.

P. natans is a British plant, with floating oval stalked leaves, the petals plano-concave above, the nuts large, rounded on the back when fresh keeled; when dry the peduncles are equal. There is a creeping rhizoma at the bottom of the water. The roots are sometimes eaten in the wilds of Siberia by men, but in more temperate regions are fed on only by swans, who devour them with avidity.

P. crispus has a compressed stem, pellucid oblong linear leaves, sessile and wavy, the nuts with long beaks, keeled on the back. The seeds are dry the peduncles are equal. It is a native of Great Britain. P. densiss has its leaves all opposite, pellucid, clasping, elliptical-lanceolate or lanceolate; the spikes shortly subulate, ultimately contracted into a spike-like fruit. It is found on ditches and ponds of water in England. Ducks feed on the seeds and leaves of both these species, but they serve a more important purpose in giving out oxygen, and rendering the water respirable for fish and other aquatic animals. There are twenty British species of Potamogeton, and Haller says in the Swiss lakes P. serruriu grows to the length of from 10 to 20 feet, forming extensive subaquatic forests.

(Barnet’s Outline of Botany; Babington’s Manual of British Botany.)

POTAIOUMYA, a genus of Conchiola from the freshwater streams of the Potomac Mountain, of the Lake of Wight. (Sowerby.)

POTENTILLA (potent, powerful, from the supposed medical qualities of some of the species), a genus of plants belonging to the natural order Rosaccemae. It has a concave calyx from 4 to 5-parted, with 4 or 5 bretels; there are from 4 to 10 petals, with inconspicuous stamens, a lateral ovary, and a nearly terminal style. The fruit consists of numerous small nuts placed on a flatish dry receptacle; the seeds pendulous or ascending, the radicle of the flowers white, and the flowers yellow. P. rotundifolia, Cuminginn, is a common British species: it is found likewise in other parts of Europe. The style is filiform, procumbent, and creeping; the leaves quinate and stellate-pinnatifid; the flowers white, and the peduncles solitary or corymbose, the flowers yellow, small, with the parts of the calyx and corolla in fours on slender hairy stalks much longer than the leaves. It is the Potentilla erecta of Linnaeus. It abounds in Great Britain, and is used as a medical remedy, and has been medicinally. In the Western Isles of Scotland and the Orkneys they are used for tanning leather, and are preferred even to oak-bark. They are also used for dyeing a red colour. As a medicine they are much used; and are also thought to be serviceable in some diseases to which sheep are subject.

F. amercia is a creeping stem, interruptedly pinnate leaves; the leaflets numerous, oblong-cordate serrate, silky beneath; the peduncles solitary. The flowers are large and yellow, and the leaves form a favourite food with geese: they are sometimes used as pot-herb. Its roots are eaten both by hogs and men; they taste like a pea-soup, but are small; the common people roast or boil them for food. In the islands of Tiray and Col they answer in some measure the purposes of bread, and have been known to support the inhabitants for months at a time during times of scarcity.

The leaves of P. fruticos and P. reptis are employed in Siberia as a substitute for tea.

P. hispidus (from hispis, a few-flowered stem; the leaves with 5 or 7 leaflets, pilose, and cut at the apex; the stigmas lanceolate, entire; the petals obcordate, longer than the calyx. It is native of the Pyrenees, South of France, Sicilia, &c., and is the Bardana of Hippocrates, &c., &o., &c., &.

All the species of Potentilla are of easy cultivation, and some of them are handsome when in flower. They will grow in any common garden-soil and are easily propagated by dividing at the roots or by seed. The shrubbery kinds are very proper for the front of shrubberies, and they grow freely from cuttings planted in the autumn in a sheltered situation.

(Don, Gardiner’s Dictionary; Lindley, Vegetable Kingdom; Lindley, Flora Medica; Babington’s Manual of British Botany; Burnett, Outlines of Botany; Frass, Synopsis Flora Classicorum.)

POTERIUM (from poter, a drinking-vessel or cup, one of the species being infused in drink), a genus of plants belonging to the natural order Rosaccemae. It has monoeocious or polygamous flowers: a 4-leafed calyx, with three external scales at its base; and a quadrangular tube. The petals are wanting, the style terminal, stamens numerous, and the seed suspended.

P. sanguis-ost, lesser Burnet, is an herbaceous plant, with a slightly angular stem, the calyx of the fruit quadrangular and hairy, the nut has the leaves pinnatifid, the ovaries ovate corymbose serrate leaflets, glabrous or slightly hairy beneath. It is found on dry calcareous soils in Great Britain. It forms a useful fodder for cattle, and at one time was extensively cultivated. It is now generally superseded by safflower and other artificial grasses. On the Continent, and occasionally in this country, the young leaves are eaten as salad, and it is said to form one of the ingredients of the favourite cool tankard. It is said to give the name to the species, from the custom of infiltrating it in liquors. The common people of Siberia eat the roots. There are about nine species of Burnet described, which are distributed over Europe, Africa, and America. The hardy herbaceous species will grow in any common garden soil, and are best propagated by seeds, as most of them are little better than biennial plants. The shrubbery species thrive best in a light rich soil, and young cuttings may take a good position as a hedge, or may be laid on the ground on which it is to grow upon themselves or round the vessel in which they are confined; they are likewise exposed to great varieties of temperature and defeat, and can suffer much without moisture. It is therefore the object of the careful gardener to have as large a collection of these plants as is possible; and at the same time to secure the advan-
gages derived from the operation itself. These advantages consist mainly in the facility with which it enables the gardener to change the arrangement and position of his plants; it also, by cramping the roots, diminishes the tendency to form leaves, and eases the disposition to flower. It secures a constant and effective drainage from the roots, and renders it more easy to expose them to a favourable amount of bottom heat. For the raising and nourishment of young seedlings it is also an advantageous process. Exchange of the soil is one of the inconveniences which result from this system. In order to remedy it liquid manure should be applied; or the plants placed in peat-soil, shallot earth, or vessels containing moss or other substances through which the roots can seep through holes in the bottom of the pot. It is however to shifting more particularly that recourse should be had for renovating the soil; and this, if skillfully performed without injuring the plant, is most successful. It is not alone for the purpose of improving the soil that shifting is desirable; the roots if allowed to remain long in a confined space form a hard knotted mass, which is very unfavourable to the retention of moisture and the growth of the plant. All the earth therefore which clings to the roots should be carefully separated before the plant is placed in the fresh soil. The roots of a plant are always found to be in contact with the sides of the pot, and this, being generally composed of a highly absorbent substance, is subject to great variations of temperature. The practice of plunging greenhouse plants into the earth during the summer to obviate this is very unsatisfactory, as when they are again taken up the roots are generally found to have taken advantage of the earth around them and to have fastened themselves in it. The best mode of countering the injurious effects of unequal temperature is, as the use of double pots, as recommended in the Gardener’s Mag. ix. 576, the space between the two pots being filled with moss or some other substance retentive of moisture. The drainage of potted plants is of great importance, and in all cases a quantity of broken pieces of tiles and earthware should be placed at the bottom of the pots to prevent the stagnation of water about the roots. To be managed perfectly a young plant should be placed in as small a pot as it will grow in, and gradually and successively transferred to large pots as it advances. Dr. Lindley says: ‘It is by paying constant attention to the shifting of the growing plant, by the employment of a very rich stimulating soil, and by thorough knowledge of the kind of atmosphere which suits them best, that have been obtained those magnificent pelargoniums, cockscobs, and balms, &c. that have so often and so justly excited the admiration of even the most experienced gardeners.’

(Lindley, Theory of Horticulture.)

POUNDAGE. (Subsidy, P. C.)

POW. We find that the article ‘Root, P. C.,’ does not answer the reference made from Powr, P. C. We briefly supply the defect here, and take the opportunity of describing some important suggestions which have been recently made as to the manner of conducting algebraical operations.

In P. C. leaves and roots are used in which the term power was introduced into arithmetical is seen. By definition, the fourth power of x means the product of four x's, or \( x \times x \times x \times x \), and the same of other powers. But it is far more symmetrical to begin from unity; and to say that the fourth power of x is the result of four multiplications by x, unity being understood as the commencement. Thus the successive powers of x, first, second, third, &c. are \( 1 \times x \), \( 1 \times x \times x \times x \), &c. denoted by \( x^1 \), \( x^2 \), &c. And the term root is the inverse of power, as follows: If A be the nth power of B, B is the nth root of A, denoted by \( \sqrt[n]{A} \).

The algebraical character of the roots is explained in Root, P. C.

It is thus easily proved that when m and n are any two integers,

\[ x^m \times x^n = x^{m+n} \]

when m is greater than n, \( x^m \times x^n = x^n \cdot x^{m-n} \), that is, \( x^m = x^{m-n} \), and that \( x^n = x^n \) whenever m is divisible by n without remainder. These rules, if applied in defiance of the restrictions first mentioned, lead to such results

\[ x^0 = 1, \quad x^1 = x, \quad x^{-1} = \frac{1}{x}, \quad \text{&c.} \]

which are unintelligible as far as the definitions have yet been stated. Their proper interpretations [interpretation, P. C.] are as follows:—First, \( x^m \) must be allowed to stand for unity, whatever \( x \) may be; secondly, \( x^{-m} \) must be understood to be \( \frac{1}{x^m} \); thirdly, \( x^n \) and \( x^n \) being positive integers, must stand for \( x^n \). When these new definitions are added, all the rules remain true, whether \( x \) and \( x \) be positive or negative, integral or fractional: and the system of algebraic powers is complete.

An algebraic expression is said to be arranged in powers of a letter, say \( x \), when the powers of that letter which enter are made to enter in ascending or descending order of algebraic magnitude. Thus \( ax^2+bx+c \) is not at present arranged at all. To arrange it in ascending or descending powers of \( x \), we must write it thus:

\[ \pm ax^2+bx+c = \pm a x^2 \pm bx \pm c \]

But even yet it is incomplete for many algebraical purposes, having no written indication of the fact that the ascent or descent is interrupted. Completely written in ascending powers, it should be

\[ ax^2+bx+c = a x^2 + b x + c \]

Written in this form, which may remind us of the use of a cipher in writing ordinary numbers, it is clear that we hardly read the expression as readily, and write it much more briefly if we omit \( x \) and its powers altogether, and make some distinctive mark, analogous to the decimal point, between the parts which belong to the positive and negative powers. Thus the above might be written:

\[ b^0+1a=1+0+0 \cdot a+1=1+0 \cdot a \]

the mark | being on that side of the adjacent + or — which belongs to the positive powers. This mark however is not necessary in what follows.

The late Mr. Horner [isvolteric, &c. P. C. and P. C. S.] was the first who suggested the systematic rejection of the ascending or descending powers. An example of multiplication and division will sufficiently explain it. Suppose it required to multiply \( 7x^2-2x-3 \) and \( 2x^2+2x-5 \):

\[ 7x^2-2x-3 \times 2x^2+2x-5 = \]

\[ 14x^4-14x^3-7x^2-14x+15 \]

Accordingly the answer is \( 14x^4-14x^3+7x^2-36x^2+27x+15 \), and every stroke of the pen which the usual method contains, more than is in the preceding, is mere waste, and risk of error into the bargain. Now let it be proposed to divide \( 4x^2-3ax^2+2x^2 \cdot ax^2-a^2 \) by \( 2ax^2-2x^2-a^2-a^2 \):

\[ 4-3+2 \cdot 0+0-11+12+2 \cdot 0+1 \]

Accordingly the quotient is \( 4x^2-12ax-24ax^2-44x \) and the remainder is \( 7x^2+36ax+64x^2 \).

Mr. Horner himself did not live to publish this suggestion, which, simple as it is, seems never to have been made before him. The possessor of his papers, Mr. T. S. Davies of Woolwich, published some extracts from those papers in an appendix to a reprint of the paper on the solution of equations, which reprint appeared in the ‘Ladies’ Diary’ for 1838; having previously introduced the simplification into the 11th edition of Hutton’s Course. Since that time a paper on ‘Algebraical Transformation in Equations’ by Mr. Horner to the Royal Society, but not printed in the ‘Philosophical Transactions,’ has been pub-
Hence the quotient is

\[
11 + 2m + 2n + 36n = 1 + 2m + 2n + 36n
\]

and the remainder is

\[
20m + 24m^3 + 48m^4 + 864m = 16x + 82x^3 + 64x^4 + 128x^5
\]

One of the easiest modifications of this rule is the division of \( ax^n + bx^{n-1} + \ldots \) by \( x - p \) or \( x + p \), as explained in fractions, decomposition of, P. C. S.

POZ. POZO DI BORGO (sometimes BARG) CARLO ANDREA, the half-disgraced diplomatist, was one of that considerable number of remarkable men produced by the island of Corsica in the earlier part and middle of the last century. He had ranked among the nobility of the island ever since the twelfth century; and he was born on the 8th of March, 1764, at Ajaccio, also the native place of Napoleon Bonaparte. The latter was the younger by five years, but they were in early life intimate friends. After having received a careful elementary education in his own country, Pozzo di Borgo went to finish his studies at Pisa; whence he had not long returned when Corsica, now under the dominion of France, was excited and shaken, like all the rest of that kingdom, by the outbreak of the Revolution of 1789. He had attached himself to General Paoli; and, under the patronage of that venerable head of the patriots, he was appointed, along with General Cabasson, to proceed to Paris in 1791 at the thanks of Corsica to the Constituent Assembly for having declared the island an integral portion of the French territory. This mission led to his being nominated a member of the Legislative Assembly, which commenced its session in October, 1791. While occupying this position he is stated to have attracted considerable notice by the knowledge and talent he showed in the diplomatic committee. When the Legislative Assembly was dissolved, in September, 1792, he returned to Corsica, and there joined Paoli in those efforts by which he accomplished the liberation of his country for a season from France, and the restoration of a native government under the protection of the convention. The constitution was established, in the summer of 1794, Pozzo, who had previously acted as one of the Secretaries of the General Consult held at Corte, by which the constitution was drawn up, was appointed, according to his biographer M. Capédiègue, President of the Council of State, that is, we suppose, the Board of Council, nominated by the King of England to assist the Viceregal. When the English abandoned Corsica, in 1797, he came to this country with the Viceregal infant, (afterwards Earl of Minto); and he remained here for about a year and a half. While in England Pozzo was considered as the principal adviser and agent of the French refugees; and it is from this period of his life that we derive the real name of his original, not the formal, commencement of his diplomatic career. In 1799 he proceeded to Vienna, where he attempted unsuccessfully to bring about a coalition between Austria and Russia.

He continued his residence at Vienna during the subsequent years, and after the conclusion of the treaty of Amiens, in 1802, he entered the diplomatic service of Russia, in which he spent the remainder of his life. Having been made a Councillor of State, he was first sent on a mission to Vienna, whence, after a few months, he was despatched in the character of Russian commissioner to the army, composed of English, Russian, and Neapolitan forces, in the North of Italy. After the battle of Austerlitz and the peace of Freiburg (December, 1805) he returned to Vienna, and thence proceeded to Petersburg. When Prussia rose against Napoleon in October of the year following, and was about to be joined by Russia, Pozzo received the military rank of colonel, and was to have accompanied the emperor as one of his suite, when the scheme of the confederates was struck to the ground and annihilated by the fatal battle of Jena (14th October, 1806). He now proceeded once more to Vienna, where he endeavoured, without success, to induce Austria again to take up arms. Meanwhile war had, at the instigation of France, been declared against Russia by the Porte (30th December, 1806). In the beginning of the year 1807 he joined the English fleet which was sent, under Sir Thomas Duckworth, to force the passage of the Dardanelles. He was present in the battle fought between the Russian and Turkish fleets near the island of Tenedos on the 1st of July, when the Turks were signalily defeated. But on the 7th of the same month Russia made peace with France by the treaty of Tilsit, one of the articles of which provided for an armistice between...
Russia and the Porte, which was accordingly concluded on the 24th of August following. Pozzo, all whose feelings were vehemently anti-Galicen, now obtained Alexander's permission to travel; upon which he proceeded to Vienna, and he received, with joy, the tidings of the total destruction of the fifth Anglo-Austrian coalition against France by the peace of Vienna (14th October, 1809).

He now betook himself to Constantinople, whence he proceeded to Persia, where he was appointed, by the Sultan, as his envoy, in the end of 1810. There he remained till after the expulsion of the French by the Romans in the winter of 1812; when he was recalled by Alexander; and, passing through Sweden, he met the emperor and the queen, who were, by the treaty of 1810, prince royal of Sweden, had already engaged to join the combination against France by the treaty of Peters burg (24th March, 1812); but he still hesitated to commit himself by any actual movement. Pozzo, who had had an interview with him on his way to Kalisz, was now sent to urge him upon the same terms that other negotiations were opened with Moreau, and with Murat and Eugene Beauharnais; and he at last succeeded in overcoming his scruples. After the Congress of Prague (July, 1813), Pozzo, now raised to the rank of major-general, was sent to Bernadotte at Berlin; and it is said to have been by his representations that the Swedish prince-regent was prevailed upon to take part in the battle of Leipzig (18th October, 1813). Meanwhile, immediately after the previous affair of Grosberin (23rd August), Pozzo had been despatched to Frankfort, to take part in the military council, where it was determined that the destruction of the enemy, which was in the beginning of January, 1814, he proceeded to London, charged with a request from the allied sovereigns that Lord Castlereagh might be sent over to join their deliberations. He soon returned from that mission, and was appointed minister, with whom he proceeded to Bautzen, where the allied sovereigns were now assembled. He continued in close attendance upon the Emperor Alexander at the Congress of Chaussé, where he strenuously opposed the proposal of the French to offer the offers made by Bourbon, and throughout the rest of the campaign of the first months of 1814, till they had the satisfaction of seeing Paris together on the memorable 1st of March. Pozzo, after the death of the Emperor, was placed in command of the forces, guarding the passage of the Niemen, keeping Alexander steady and in determining him to give up the restoration of the Bourbons, was now nominated Russian commissioner to the provisional government, and was soon after despatched to England to bring over Louis XVIII., with whom he returned to Paris on the 3rd of May. He remained in the French capital till the meeting of the Congress of Vienna in the beginning of November. At the conferences there he advised that the deposed emperor should be sent out of Europe; and he is said to have produced some coldness towards him for a time on the part of Alexander by his violent opposition to the project of the liberation of the Czar of restoring the old kingdom of Poland. The changed aspect of things, however, that followed the escape of Bonaparte from Elba (1st March, 1815) at once chilled Alexander's mind, and inspired him with the notion of the restoration of Napoleon. The latter immediately proceeded to Louis XVIII. at Ghent, and, having then joined the allied army as Russian commissioner, he was present in that character at the battle of Waterloo, where he received a wound. He now returned to Paris, and, declining Talleyrand's invitation to take office in the French ministry, resumed his former functions of Russian ambassador, and in that capacity he signed the Treaty of Paris of the 20th November. Soon after the Duke de Richelieu, now head of the ministry, conferred upon him the rank of a count and peer of France. He does not appear to have again left Paris till he was sent, after the Spanish campaign of the Duke of Angouleme, to report on that event, from which, however, he soon returned to the French capital. The death of the Emperor Alexander and the accession of Nicholas (31st March, 1825) did not alter his position; and he retained it, till the year 1828, after which he was recalled to St. Petersburg in 1824. Passing on his journey thither through Vienna and Berlin, he had the Order of the Red Eagle conferred upon him by the decrees of Alexander, which were passed by order of the emperor, by which the breaking out of the War of the East in 1825 he was sent on a mission to London; after a stay of only a few months he returned to his former post at Paris; but he was soon sent back to Petersburg from the land to which he had been sent, to the Great Britain. According to M. Capefigue, he felt this appointment as both a mortification and a disgrace, and it affected him greatly: but M. de Nessebois consoled him with the promise that as soon as they should have turned the Duke of Wellington from his inclination to join with Austria (de se rapporcher de l'Autriche) in the Eastern question, and should have supported the Tories in an effective manner, then they would give the task to Pozzo. Pozzo should to follow the French customs and pursuits. M. Capefigue, as is well known, deals largely in all his writings in information of this sort, of which no other writer has had the luck to hear, and which we must admit to be among the most instructive. Count Pozzo, however, got back to Paris ere long; and all that there is further to be told of him is that he died in that capital on the 15th of February, 1842.

(Absented, with the rest of the deets, most of which we have supplied, from a very elaborate article in the Biographie Universelle, vol. 77 (Supplement), pp. 497-507, by M. Capefigue, which has also been published separately.)

PRELATE (Busaco, P. C.)

PRESCRIPTION, by the law of Scotland, a much wider operation than either by the civil law or the law of England, supplying the place of the Statute of Limitations in the latter system. It not only protects individuals from adverse proceedings which other parties might have conducted if the lapse of time has not taken place, but it in some instances creates a positive title to property. The prescription or title by the act of the years 1796 and 1797 is no longer said generally to preclude the right of exacting performance of any claim, as to which no judicial attempt has been made to exact performance for fours years from the time when it was supposed to be due. The right to a thing of value must be both positive and negative. The party holding the property must, by himself or those through whom he holds, have been forty years in unchallenged possession of the property on a just and reasonable ground—in this is called positive prescription; and the claimant and those whom he represents must have been forty years without an ostensible title, and must, by not judicially attacking it, have tacitly acquiesced in the possession. An action raised in a competent court interrupts the long prescription. It is usually stated in the Scottish law-books that it is interrupted by the mortality of any person who could challenge the opposing right; but it would be more correct to apply in this case the phraseology of the French lawyers, who say it suspends prescription, as the years of minority are merely not counted in making up the period of the prescriptive right when there is a judicial interruption, a new period of forty years commences to run. When the prescription applies to a pecuniary obligation, payment of interest or an acknowledgment of the obligation, it is said to be interrupted, not by the death of the obligor, that, by a sort of analogy from the system of prescription, when there is in Scotland any judicial inquiry as to the antiquity of a custom, it is usual to limit the period of the prescriptive right to forty years, as in England. Such a period as has existed from time immemorial. It has been having the practice in the neighbourhood of Edinburgh for the proprietors of land to irrigate fields with the contents of the city sewers—the system increasing until it became offensive to the neighbourhood—these proprietors produced evidence of having their continued the practice for forty years; and although it had during that time increased from an evil felt only by the individuals immediately concerned with the practice, to the extent of a public nuisance, these proprietors have, so far as the dispute has hitherto gone, been able to defend themselves on the ground of prescription.

The other and other prescriptive systems cut off particular descriptions of claims or methods of supporting them. By the vicennial or twenty years' prescription, holograph writings, not attested with the usual solemnities of Scottish writers, cease to have any character of 'bear' and are presumed, after the passage of the Revolution of 1800; but he at last revisited St. Petersburg in 1824. Passing on his journey thither through Vienna and Berlin, he had the Order of the Red Eagle conferred upon him by the decrees of Alexander, which were passed by order of the emperor, by which the breaking out of the War of the East in 1825 he was sent on a mission to London; after a stay of only a few months he returned to his former post at Paris; but he was soon sent back to Petersburg from the land to which he had been sent, to the Great Britain. According to M. Capefigue, he felt this appointment as both a mortification and a disgrace, and it affected him greatly: but M. de Nessebois consoled him
claims for wages, each year's wages running a separate pre-
scription, and ceasing to be extant, if not pursued for,
in the lapse of three years from the time when it became due.
PRESENTATION TO A LIVING. [ADVOWSON, P.C.] PRINGLE, and
OF A BILL OR NOTE. [BILL
OF EXCHANGE, P.C.]
PRESS, BRAMAH'S, OR HYDRAULIC. [HYDRAU-
LICS, P.C., p. 384; BANDANAS, P.C.S., p. 169; OILS,
MANUFACTURE OF, P.C.S., p. 374.]
PRESS. [PRINTING-PRESS, P.C., p. 18; SCREW-
PRESS, P.C., p. 111; OILS, MANUFACTURE OF, P.C.S., p. 374.]
PRESS, LIBERTY OF THE. [CENSORSHIP, P.C.S.]
PRINGLE, THOMAS, was a powerful advocate of arts of Com-
bridge and a fellow of King's College; and he was afterwards
created a doctor of law and master of Trinity Hall. In 1564
he acted with great applause before Queen Elizabeth, in
Rightside's Latin play of Dido. About the same time, or
a little earlier, he wrote 'A Lamentable Tragedy, mixed
full of pleasant mirth, containing the life of Cambises king of
Persia, &c., and last of all his odious death by God's justice
appointed: done in such order as followeth.' This rude and
imperfect old piece is curious from its early place in the history
of the English drama; but its tumidity made it a fair mark
for Falstaff in proposing to be tragic in 'King Cambises' ve
play, printed from the undated edition, in Hawkins's 'Origin of the English Drama,' 1773.
PRIMULA, a genus of plants belonging to the natural
order Primulaceae. It has a tubular 5-cleft calyx, a silver-
shaded leaf, a long, slender, spreading limb in 5 rather deeply heart-shaped obtuse
segments; a free 1-celled ovary, with a free central placenta.
It has a capitate stigma and 1 style. The fruit is a capsule
with 5 long spreading seeds.

P. vulgaris, Primrose, is one of our commonest British
plants. It has oblong, ovate, wrinkled crenate leaves; single
flowered scapes and a tubular calyx; linear, lanceolate, atten-
uated tooth very acute; the limb of the corolla flat. It is
found in woods and thickets, and is one of the earliest of our
spring flowers.

P. dioica, Oxlip, has ovate leaves contracted below,
without the denticulate, many-flower umbellate scapes, a
pulvinar calyx; lanceolate acute tooth; the limb of the corolla
concolor, with cordate ovate segments; nodding flowers and
effect fruit. It is found in woods and meadows, but rarely in
England.

P. sericea, Cowslip, has ovate wrinkled crenate leaves,
contracted below, many-flowered umbellate scapes; a bell-shaped
calyx, rather downy, with short ovate teeth; the limb of the corolla
concave, or cup-shaped; a deeper yellow on the upper
side, with 5 orange spots. It is found plentifully in
meadows and pastures in England. The flowers possess well-
marked dark lips, and are very showy. They make a pleasant
grove inside a tubercle. The fresh root has also a smell resembling
anise, and was formerly employed as a tonic medicine and
also as a diuretic.

P. scotica is distinguished by its more ovate lanceolate
leaves, oblong ovate calyx, linear teeth, and obcordate
segments rounded below, distant, and as long as the tube. It
is found in the North of England and Scotland, and is called the
Bird's-eye Primrose.

P. auricula is found only in the North of Scotland. It
is known by its swollen calyx, with short ovate obtuse teeth;
it is a crenate, and is adapted to make a pleasant
flowering scapes. The flowers are of a bluish purple colour with a yellow core.
The leaves of P. auricula are used in the Alps as a remedy
for coughs. Swine are the only animals that feed upon any of
the leaves, as they are expressly unpalatable. They are
valuable chiefly on account of their beautiful appearance and
their early blossoming.

(Lindley, Vegetable Kingdom; Lindley, Flora Medica;
Balfour, Outlines of Botany; Balsington, Manual of British
Botany.)

PRINGLE, THOMAS, was born January 5, 1789, at
Blacklaw, in Tiviotdale, Scotland. His father was a respect-
ably well-to-do merchant. Pringle was then very young, was dislocated at the hip-joint by an accident,
which the nurse imprudently concealed till reduction was no
longer practicable, and he was thus obliged to use crutches
for nearly two years. In his seventh year he was sent to
school at Kelso, and three years afterwards went to Edin-
burgh to complete his studies at the university; after which
he became a clerk to the Commissioners on the Public Records
of Scotland. His employment was merely that of copying
old records, and his salary was barely sufficient for his humble
wants.

In 1811 Pringle and a friend published a poem called 'The
Institution of Music'; and the friend, being disposed to have
them some praise but no profit. In 1816 he was a con-
tributor to 'Albyn's Anthology,' and the author of a poem in
the 'Poetic Mirror,' called 'The Autumnal Excursion,'
which was written by Robert, and was the origin of Pringle's
acquaintance with him. About the same time he was busy
with the project of establishing a magazine as a rival to the
'Scott Magazine,' and when his plan was pretty well ad-
vanced, he was informed that his works were not so much read as he could suppose if his project was unsuccessful. Among his
coadjutors were Lockhart, Wilson, Cleghorn, Dr. Brewster,
and Hogg. Early in 1817 the 'Edinburgh Monthly Magazine'
appeared, of which Pringle was the editor. His most
important contribution to the first number was an article on
the Gipae, the chief materials for which were furnished by
Scott, unasked for and gratuitously, and which Scott had
himself intended to work up into an article for the 'Quarterly
Review.' About the same time Pringle became editor of the
'Edinburgh Star' newspaper. The magazine soon fell into
the hands of other proprietors, and changed its title to that of
Blackwood's Magazine.' Pringle still continuing to be the
editor, at the same time that he became joint editor of 'Con-
stable's Magazine'; but disputes between Pringle and Black-
wood led in a short time to a separation. Before this un-
toward event took place, he had married. Soon after, he
published 'The Excursion, and other Poems,' with little
or no profit. The editorship of 'The Star' newspaper
was unprofitable, and he resigned it; and he probably
derived little comfort from it. Constable's Magazine, in 1819,
was again on his former seat in the Register Office, performing
the laborious drudgery of a copying clerk to the
Reverend Commission.

Meanwhile Pringle's four brothers, all of whom were farmers,
had become more or less unprosperous, and he proposed
that they should avail themselves of the government scheme
of colonizing the unoccupied territory at the Cape of Good
Hope. One of the brothers had previously made a tour to the
United States of North America. The other brothers agreed to
his proposal, though the eldest brother could not get his affairs
arranged in time to accompany them; but he promised to
follow them, and Pringle undertook the management of his
farm till his arrival.

The party of twenty-four persons, consisting of twelve
men, six women, and six children, was set sail at the
Cape of Good Hope in April, 1830. On the 21st of
June they reached Rooiwal, on the Great Fish River, and
after a toilome march of some days arrived at their place of
destination. Pringle was the representative of the crown in the
colonies, and was appointed to examine the state of the
small colony, having surmounted the first difficulties, became
more prosperous, and finally arrived in July, 1833. He
resigned his farm, and went to seek employment at Cape Town, as
had been his original intention. Scott, Sir John Macpherson, and others, had exerted
their influence with the colonial secretary, and Pringle was
offered and accepted the situation of librarian to the govern-
ment library. The salary was only 75l. a year, but afforded
a fair ground-work of income to a working literary man. He
at first received pupils for private instruction, and then, in
conjunction with the Rev. Mr. Faure, a Dutch clergyman of
the town, made arrangements for the publication of a
periodical in English and Dutch. Lord Charles Somerset, how-
ever, who was one of Pringle's most ardent supporters, in
1833, would not permit any journal to be published except
the Government Gazette. Pringle was obliged to submit,
and wait the arrival of commissioners, who had been sent out
by the British government to examine the condition of the
colony. The commissioners, when they arrived, approved
of his plan; but their powers did not extend beyond that of
making a report to the home government.

Meanwhile Pringle's right limb, when with his friend Mr.
Fairbairn, who had followed him from Scotland, organized
a private academy on an extensive scale, which was prosperous
beyond their expectations. While occupied with this new
business, Pringle still continued to examine into the state of the
government from the governor authorizing him to commence his periodical, the
colonies, which, it seems, had met with the approbation of
Lord Bathurst, who was then colonial secretary.
The 'South African Journal' forthwith appeared, one edition in English and one in Dutch. Soon afterwards, Mr. Greig, a printer, commenced the 'South African Commercial Advertiser,' a weekly newspaper, of which Pringle became the editorial writer, as well as the editor. The two works were prosperous, the pupils of the literary incipient, and Pringle fancied himself about to make a rapid fortune.

A man of the name of Edwards was tried for a libel on the governor, and the trial, like others, was expected to be reported. On this occasion, however, the Fiscal was ordered to proceed to the printing-office, and assume the office of censor of the press. Pringle states that everything likely to be personally offensive to the defendant had been carefully excised, but he refused to submit to this assumption of arbitrary power, and having no legal means of resistance, threw up his editorialship. Greig discontinued the publication of the journal, to the great regret of his readers his intention of appealing to the British government. Greig's press was immediately ordered to be sealed up, and himself commanded by warrant to leave the colony within a month. The Fiscal at the same time assumed the censorship of the Magazine also, stating that if he had been aware of certain paragraphs in the second number he would have expunged them or suppressed the numbers. Pringle declared his right of censorship as a printer, and the hardy species of Pringle who stood alone, the 48th continuity of the work in the Gazette. A petition to the king in council was got up by the respectable inhabitants, and the governor became alarmed. He summoned Pringle to appear before him, and had the churlish justice, at first attempted to bully Pringle into submission, and, failing in that, tried to exjole him, and bring him over by flattery; Pringle, however, resolutely refused to recant, or conform, and the presses were ordered to be closed until the law, and not the press, should not be interfered with except by legal process.

To this the governor would not agree, and Pringle retired, and immediately resigned his appointment as librarian. The result was that the government, in order to save face, finding himself ruined in circumstances and prospects, deemed it prudent to leave the Cape, and in July, 1836, arrived in London. He applied to the government for compensation for his loss, which he estimated at £600. Meanwhile, he was engaged as secretary to the Anti-Slavery Society, a situation which he held till slavery was abolished; he became the editor of 'Friendship's Offering,' wrote and published a 'Narrative of a Residence in South Africa,' and contributed to the chief periodical works of the day.

In June, 1834, Pringle wrote to his doctor, to say, that in taking supper a crumb of bread passed down the windpipe, and brought on a violent fit of coughing; that a little blood flowed, which however soon ceased; but that in the morning he felt a sensation as if there had been some slight abrasion of the part. This slight abrasion seemed to have produced concomitant symptoms, and he felt himself becoming familiar with a warmer climate afforded the only chance of saving his life. He was preparing to return to the Cape, and had actually engaged a passage for himself, his wife, and her sister, when he received a letter from the ule of the weak state of body, occasioned his death, December 5, 1834.

The greater part of Pringle's works probably consist of fugitive pieces written during the time when he was secretary to the Anti-Slavery Society; but his reputation as a poet depends mainly on his 'Narrative' and his 'Poems.' His 'Narrative' is very entertaining; somewhat diffuse perhaps, but simple, distinct, and effective, interspersed with passages of picturesque power and beauty, and characterized throughout by the appearance of unassuming truth. He published also an 'Account of English Settlers in Albany, South Africa,' 12mo. His poetry has great merit. It is distinguished by elegance rather than strength, but he has many forcible passages. The versification is sweet, the style simple and free from all superfluous epithets, and the descriptions are the result of his own observations. His 'African Sketches,' which consist of poetical exhibitions of the scenery, the characteristic habits of animals, and the modes of native life in South Africa, are alone sufficient to entitle him to no mean rank as a poet.

PRINOS (πρίνως is the Greek name of the Holly, which the present genus much resembles), a genus of plants belonging to the family Rosaceae, flowers, a permanent half 6-clawed calyx, a rotate 6-parted corolla, 6 subulate erect filaments, a short style with an obtuse stigma, and a berry with 6 stomes. The species are shrubs with alternate deciduous or permanent leaves. P. verticillatus has oval deciduous acuminate leaves, serrated, pubescent beneath; small white flowers in little imperfect axillary umbels, which are nearly sessile. The calyx is small, 6-clawed, and persistent; the petals monopetalous, spreading, without a tube, the border divided into 6 obuse segments. The fruit is a bright scarlet, roundish, supported by the persistent calyx and crowned with the stigma, 6-celled, containing 6 long seeds which are convex outwardly and sharp edged within. The bark is very bitter, and has been substituted for Cinchona bark in cases of fever. Dr. Meere and other European practitioners employ it as a tonic in cutaneous disorders and in cases of gangrene. The berries are said to be tonic, and Bigelow asserts that they are emetic.

P. plebejus, Glabrous Winter Berry, has rather pubescent branches, evergreen cuneate lanceolate coriaceous smooth shining leaves, a little toothed at the apex; the pedicels are axillary, usually solitary, for the most part 3-flowered. It is native of North America from Canada to Florida. The berries are black, and are called in Jersey Ink Berries. It is a low handsome shrub, and is said to be one of the plants the leaves of which are sometimes used instead of Paraguay Tea. The leaves of a number of trees of the Eucalyptus genus are evergreen, and will thrive in any common light soil, but they prefer peat. They are readily propagated by laying down the shoots or by seeds. The stove species will grow well in a mixture of loam and peat, and ripened cuttings will root in sand under a hand-glass in moderate heat.

(Don, Gardener's Dictionary; Lindley, Vegetable Kingdom; Burnett, Outlines of Botany.)

PRINTS AND DRAWINGS. [COPYRIGHT, P.C.] PRISMATIC TELESCOPE AND SEXTANT. Instruments bearing these names were invented by Professor Amici, at Modena, and the former is briefly described by Sir John Herschel in the Treatise on light in the Encyclopaedia Metropolitana.' In its simplest form it consists of two pairs of triangular prisms of glass, each pair being such that an object seen through the two shall be free from colour. In order to understand its construction, let ABC, DEF, in the plane of the paper, be the principal sections of the prism, and let P and Q be the oblique objects to be rendered perpendicular to the paper, so that the sides which pass through P and Q perpendicular to the paper may be parallel to the refracting edges of the prisms; also let the eye of the spectator be situated at E, in such a position that the light falling on the surface of the square will, after refraction in the prisms, produce in the eye an image of a rectangular form, having the breadth in the direction of PQ greater than the length perpendicular to the paper being smaller. If now the rays emergent from the second prism be made to pass through two others similar to ABC and DEF, but having the plane of their principal sections perpendicular to that of the former prisms, the visible image of the square on PQ will have the length perpendicular to the paper increased as much as PQ was before increased while PQ retains the magnitude which it had acquired. Thus, after refraction through four such prisms, the image of an object is equally magnified in every direction, and is quite free from colour: and it is easy to perceive that by suffering the rays of light to pass through other systems of prisms, similarly formed and disposed, any required degree of magnification may be produced.

Sir John Herschel conceives that a telescope of this nature might be used with advantage for viewing bright objects, as the sun, since it would require no darkening glasses, and would be exempt from all the inconvenience which opposes the perfection of telescopes of the usual construction when applied to this particular purpose.

An optical instrument, which is also called a prismatic telescope, has been devised by placing between the objective and its focus two prisms of a doubly refracting medium; thus producing two images of an object, which being by moving

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the prisms, made to approach to or recede from one another, permit the instrument to be used as a micrometer. It was invented or improved by M. Rochon, and is sometimes employed for the purpose of ascertaining the magnitudes of terrestrial objects, after the positions of their disks have been made to coincide in measuring small angular distances in the heavens.

The two prisms may be of Iceland spar, or rock crystal, and each is cut in the form of a wedge whose principal section is a right angled triangle, as ABC or A'BC, and the two are applied in contact with each other as in the figure. The prism on ABC is cut so that, AB being the axis of the natural crystal, the face passing through AC perpendicularly to the paper may be perpendicular to that axis; and the prism on A'BC so that the edge passing through B perpendicular to the paper may be the axis.

Now, if rays of light fall perpendicularly on the surface which passes through AC perpendicularly to the paper, those which, as ob, suffer the ordinary refraction, will leave, on passing through the double prism and also on emerging from thence on the surface passing through A'B', the same directions as they had at their incidence on the opposite side; while the rays which, as od, suffer the extraordinary refraction will, on arriving at the surface passing through BC, be turned from the original direction and take some other direction as ef towards B or A according as the crystal is of the kind called attractive or that which is called repulsive (suppose the former); then, on emerging from the surface standing on A'B, the rays will proceed in some direction as fs, if as they came from points corresponding to k in the rays produced, and will cross the ordinary rays in points corresponding to x. An eye placed near s so as to receive the rays of both kinds will perceive two images of the object from whence they proceeded before they fell on the prism. The constant angle at which the rays are inclined to another is measured by ach, k being in the direction of ef produced; and when the prism is of Iceland spar the angle ach may exceed 45 degrees; when of rock crystal it may amount to 10 degrees.

Let the double prism be placed between the object-glass O of a telescope and its focus, the face standing on AC being towards the former and perpendicular to the optical axis; and for simplicity, let the object be a straight line XY in a vertical position having one extremity X in the axis OE: then x and y being the foci of pencils diverging from X and Y, after being refracted through the object-glass O, the line xy may represent the image of XY formed as usual by the ordinary rays in the pencil of light, and xy'f, in a vertical line passing through xy, the image produced by the extraordinary rays; the angle \( \alpha x y' \) or \( y'k y \) being that which was denoted by ach above. Therefore, if the angular deviation of the images produced by the two kinds of rays is small enough to permit the rays to enter the eye near E, after passing through the eye-glasses of the telescope (the angular deviation not being altered by the refractions in those eye-glasses) corresponding points in the two images will in general appear to subtend some angle at the eye. If the points a and A' in the prism are at the foci x and y of the object-glass, the two images of XY will evidently coincide; but, on moving the prisms so far that the images will in general appear to subtend another angle, the angular deviations being proportional to the distance of A' from x.

Now, on the exterior of the telescope in a direction parallel to the axis, there may be formed a scale which, by means of an index moveable with the prisms, will serve to measure any subtended angles; thus:—The angle subtended at the naked eye of the observer by any object as XY, which may represent a straight line or the diameter of a circular disk, being less than the constant angle \( \alpha x y' \), there will be found a certain position of the prisms at which one extremity Y of the line or diameter seen by the ordinarily refracted rays will appear at a common distance from the observer; it has been also used in measuring small angular distances in the heavens.

The Prismatic Sextant, invented by Professor Amici, is described in Zach's 'Correspondance Astronomique,' tom. vi. p. 554. It has no mirror, but, nearly at the place where the index-mirror is situated on a common sextant, there are two triangular prisms of glass whose parallel edges are perpendicular to the face of the instrument. One of these is fixed, and the other turns on one of its edges by the motion of the index-bar, the broadest faces being parallel to each other, and nearly in contact when the index is at the zero of the arc: the telescope is fixed, and rests on a pivot near the objective; the light falling on the exterior faces of the prisms will, after two refractions and one reflexion, and after passing through the telescope, enter the eye of the observer, so that, by moving the index-bar, the angle in the index will be divided into a number of equal parts corresponding to the difference between those angles, and the divisions be continued in opposite directions, there will be constituted the required scale, by which the angle subtended when the images of any other line or disk are placed in contact, by moving the prism, may be measured.

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PRISTACANTHUS, a genus of fossil placoid fishes, from the colli of Stonesfield. (Agassiz.)

PRISTIS. Three species of this genus of fishes are menioned as fossil in the tertiary strata of England. (Morris's Catalogue.)


PRIVY SEAL. [Signet, Seal, P.C.] The Lord Keeper of the Privy Seal is a member of the Cabinet, and has a salary of 5000l a year. By an Act of 1845, however, the Commissioners of the Treasury may abolish any of the offices of Clerks of the Signet and Privy Seal when they become vacant, and direct the duties to be performed by the remaining clerks.

PRIZE-MONEY. [Prize-Money, P. C.] Appraisments and sales of prize and capture are made by agents appointed by the commanders and other commissioned officers. A certified list of the persons entitled to share in the capture is transmitted to Chelsea Hospital by the commanding officer. There is a penalty of 500l for altering names. At the end of three months from the receipt of prize-money, the treasurer of Chelsea Hospital is to notify to the 'London Gazette' and in two London morning papers that distribution will be made at the end of one month. In this notification the share of an individual in each class must be declared. Shares of prize-money due to a non-commissioned officer or soldier, will be paid only upon personal application, or to his wife, or child, father or mother, brother or sister, or to the regimental agent of his regiment, or to any other regimental agent. The payments are to be made at Chelsea Hospital, by appointment, signed by the clergyman and one of the churchwardens or overseers. Personating or falsely assuming the name and character of a person entitled to prize-money with fraudulent intent is made a misdemeanour with transportation for seven years. By 3 & 4 Vict. c. 65, the Privy Council may refer to the High Court of Admiralty matters concerning poverty and the capture of prize-money.
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PROBATE AND LEGACY DUTIES. These duties yield a sum exceeding two millions a year. The legacy duty is charged on legacies of the value of 20l. and upwards out of personal estate, and is charged on every share of residue. Legacy to a husband or wife is exempt from duty. To a child or parent, or any lineal descendant or ancestor of the deceased, the duty is 1¼ per cent.; to a brother or sister or their descendants, 1½ per cent.; to a great uncle or great aunt or their descendants, 2½ per cent.; to any other relation or any stranger in blood, 10½ per cent. The probate duty is payable by the executors, on or before 5th April in the year succeeding the death. For sums above 20l. and not exceeding 100l. the duty is 10s. if there is a will; and if there is no will the duty of 10s. is chargeable on sums of 20l. and not exceeding 50l. The duties continue to increase according to a certain scale up to 1,000,000l. The following tables show the operation of the legacy and probate duties for nearly half a century; and in Foster's 'Progress of the Nation,' vol. iii., pp. 125-139, will be found some useful and interesting considerations on these duties as indications of the progress of national wealth:

<table>
<thead>
<tr>
<th>Duty received from</th>
<th>Legacies, Probates, Administrations, and Testamentary Inventories</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>30,606,279</td>
</tr>
<tr>
<td>Scotland</td>
<td>2,190,715</td>
</tr>
<tr>
<td>Ireland</td>
<td>829,499</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>33,625,493</strong></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duty received from</th>
<th>Legacies, Probates, Administrations, and Testamentary Inventories</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>1,178,866</td>
</tr>
<tr>
<td>Scotland</td>
<td>88,073</td>
</tr>
<tr>
<td>Ireland</td>
<td>61,699</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>1,248,568</strong></td>
</tr>
</tbody>
</table>

Return, showing the Amount of Capital on which the several Rates of Duty were paid in Great Britain during the Year 1845, and an Abstract of the Total Amount paid under each Rate since 1797:

<table>
<thead>
<tr>
<th>Per Cent.</th>
<th>£</th>
<th>£</th>
</tr>
</thead>
<tbody>
<tr>
<td>½</td>
<td>24,057,848</td>
<td>87,667,258</td>
</tr>
<tr>
<td>1½</td>
<td>132,483</td>
<td>207,716,610</td>
</tr>
<tr>
<td>2½</td>
<td>14,599,395</td>
<td>70,688,181</td>
</tr>
<tr>
<td>3½</td>
<td>9,774</td>
<td>84,364,319</td>
</tr>
<tr>
<td>4½</td>
<td>1,802,106</td>
<td>12,896,479</td>
</tr>
<tr>
<td>5½</td>
<td>318,859</td>
<td>60,804,505</td>
</tr>
<tr>
<td>6½</td>
<td>22,778</td>
<td>17,797,836</td>
</tr>
<tr>
<td>7½</td>
<td>4,606,985</td>
<td>11,815,294</td>
</tr>
<tr>
<td>Total</td>
<td><strong>£45,599,714</strong></td>
<td><strong>£2,339,419,511</strong></td>
</tr>
</tbody>
</table>

PRO/CULIS, a distinguished Roman jurist, the successor of Nerva the father. He belonged to the school of Laber, and in the followers of whose school he was instructed from him. [Lamb, Antistius, P. C. S.] It is generally stated that his name was Sempronius Proculus, but Pomponius (Dig. 1, tit. 2, s. 2, § 47) calls him simply Proculus. The passage of the Digest (31, tit. 1, s. 47) which is cited to prove that his name was Sempronius does not prove that it was. In this passage Sempronius Proculus sends greeting to his grandson, and asks him his opinion about a legacy. Proculus responds. Proculus gives his opinion, and therefore the grandson and Proculus are the same person; and as Zimmern remarks, Proculus the jurist might be the son of the daughter of Sempronius Proculus the grandfather, in which case his name has been met with in another form, and has been corriged. The name of Proculus the jurist is the Licius Proculus whom Otho made Praefectus proctorio (Tacitus, Hist. i. 46, 87, ii. 39, 40, 44, 69). Proculus is often cited in the Digest, and he is apparently mentioned in a Description of the Divi Lex in an eminent authority (Dig. 17, tit. 14, s. 17). There are thirty-seven excerpts in the Digest from a work of Proculus, entitled Epitome, of which there were at least eleven books (Dig. 18, tit. 18, s. 69), though the Florentine Index mentions only one. Of the excerpts (Dig. 33, tit. 6, s. 16) has the title 'Proculus, libro iii. ex Posterioribus Labonis,' which appears to be a separate work or a separate edition of the works of Labonis. But as Javolenus wrote on the Posterioria of Labonis (Dig. 33, tit. 7, s. 4), it is conjectured that the title of s. 16 (Dig. 33, tit. 6) should be 'Javolenus.'

(Grotius, Vita Jurisconsultorum; Zimmern, Geschichte des Römischen Privatrechts, p. 816.)

PRODUCTUS, the original name given by Sowerby to a large group of fossil Brachiopoda, most frequently found in the mountain-limestone series. Productus and, for part of the group, Lernaria are described in this work.

PROLAMINATION. Prolamigation is from the Latin promulgant, which is equivalent to promulgata, and means 'to make public.' The modern sense of Proclamation of a Law is the making of it public by giving notice of its contents to the public in any way or other. Blackstone observes (Comm. i. 45), 'It may be notified by universal tradition and long practice, which supposes a previous publication, and is the case of the common law of England.' The proclamation may be notified once by officers appointed for that purpose, as is done with regard to proclamations, and such acts of parliament as are appointed to be publicly read in churches and other assemblies. It may lastly be notified by writing, printing, or the like, which is the general course taken with all our acts of parliament.' A law is a command from a political superior to a political inferior to do or not to do something, with a penalty attached to the violation of the command, and it is assumed by Blackstone that the command is made known in some way to all who are bound to obey it; or it is presumed that it is known to all. But as to 'a universal tradition or long usage,' it is a mistake to say that it supposes a previous publication. A long usage does not of itself make law; the usage must be pronounced to be law by some competent authority, and that is the only proclamation which it has. Proclamation by proclamation is inadmissible (Blackstone). It only reaches those who hear it. Further, everybody cannot hear an act of parliament which is read in churches, for the churches would not hold one-fourth of the people if they all went to hear it read. If it is said that they heard it and understood it. Printing is at present the most efficient means of promulgating a new statute; but to all those who cannot read it is ineffectual; and also to those who cannot understand it.

No remedy can be provided for these difficulties, and it is simply a positive rule of law that a new statute is binding on all persons who are under the authority of the power which makes the statute, even when the moment that the statute was made and completed in due form. It is a foolish way of speaking to say that a person is presumed to know a law, when it may be very easy to show in many cases that he did not know it and could not know it. One kind of legal presumption consists in the assumption of a fact, which presumption may be disproved by evidence. But the presumption that a man knows the law is not an assumption which a man is permitted to disprove even if he can, and this presumption should be struck out of the list of presumptions and placed among positive rules of law.

If a man were allowed to urge ignorance of law as an excuse, it might be urged by a great majority in many matters of contract and in other cases too; and the trial of the fact of ignorance of law would give ample room for fraud. The positive rule that all the members of a state are bound by its laws, causes less evil than the admission of the excuse would have. Proclamation of a law among the Romans meant the placing of the bill (regation) in some public place where it could be read before it was voted upon in the Comitia. The Roman rule was that ignorance of law (ignorantia juris) was no excuse. (Paulus, Dig. 22, tit. 6, s. 3.)

PROPERTIES OF IRON, MEDICAL. Iron, in a purely metallic state, does not exert any appreciable influence over the human system. Nevertheless metallic iron is recommended as an antidote to poisoning by the salts of copper. Iron filings have been administered with a view to precipitate the copper in a metallic and therefore in an innocuous state. White of egg is a more prompt and generally more accessible antidote. The employment of iron filings to absorb forbid earlier calculations from the skin and the lungs, while recently prepared and freshly powdered charcoal, put every morning into the shoes of those afflicted with this annoyance. Iron filings are sometimes prescribed, but before any marked effect can be produced by them, the metal must become an oxide or a salt; the presence of any acid in the stomach or alimentary canal promotes this change, while alkalis retard it. This form has been adopted in the treatment of worms, chiefly from the notion that the worms would be dislodged by the mechanical irritation of particles of iron. This is an erroneous view. [Asthenismus, P.C.] Tincture of sesquisulphide of iron in infusion of quassia is extremely

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beneficial in all cases of worms, but its efficiency depends on its tonic and astringent properties.

A few only of the preparations and uses of iron can be given here. Sesquioxide of iron (rust, or the subcarbonate of sesquioxide of iron) has been given as a tonic in very large doses; in some instances with success. It is likewise useful in some cases of spasmodic contractions of the joints. The very large doses in which it is required to be given is a serious impediment to its use; for not only are patients adverse to it, but it clogs the intestines, which require to be frequently cleared out by a brisk cathartic.

The black oxide is not so liable to objection, as it is more readily soluble in the fluids of the alimentary canal.

Ammonio-chloride of iron possesses no advantage over the simple chloride; the tincture of which, called tincture of sesquichloride of iron, is extremely valuable, as an emmenagogue; it likewise is very beneficial in checking menstruation proceeding from relaxation of the uterus. It checks haematuria from relaxation of the tissue of the kidneys. In frequently repeated small doses it relaxes spasmodic stricture of the urethra. But the sense of nausea and sickness which it causes, renders patients averse to its repetition. It acts as a potent astringent when employed externally or to mucous membranes as an injection.

Sulphate of iron can be given in small doses, in pills or otherwise. Its powers are often much heightened by combination with sulphate of quina. In nervous debility and indigestion it is valuable.

Ferro-tartrate of iron has less unpleasantness of taste than most of the other preparations of iron, and is therefore more acceptable to children, to whom also the vinum ferri is much preferred. These doses are nearly supplied by the chloride, or ammonio-citrate of iron, which can be given in the form of lozenge or syrup. The latter given in warm water or lemonade is relished by most children.

Isolde of iron is a preparation of great value in strumous disorders.

The same may be said of the phosphate of iron, a preparation formerly in the London Pharmacopoeia, and now most admirably performed. In the phthisic diathesis, in feeble subjects, with a tendency to rickets, it is invaluable. The dose for children is a very few grains, cautiously increased. The numerous preparations of iron recently introduced by chemists have not been sufficiently tried to permit them to be spoken of with certainty; but in many cases their utility is obvious. Of these the chief are citrate of iron, Potassio-citrate, Sollio-citrate, Zinco-citrate, Magnesio-citrate, Ferrico-citrate, and Citrate of quinine and iron; this last is of great service in tic douleureux.

Chalybeate waters often furnish the best medium for administering iron; especially when the iron is associated with an acid of tonic action. Where no free carbonate is present, and in some instances even where it exists, the water of the springs should be received in and drunk out of warm water. This often prevents the spasm which is apt to occur when the water is drunk cold, and may be the cause of the cathartic effect.

Besides being reputed an antidote to the poisonous salts of copper, iron is asserted to prove an antidote to various poisonous poisons.

Hydrate of peroxide of iron, called also hydriated peroxide of iron, is considered a trustworthy antidote against arsenic, if administered promptly, while the arsenic is yet in the stomach, and not absorbed. Prussic acid may be decomposed or combined, so as to be rendered innocuous, by giving promptly, first, solution of carbonte of potas, followed by a very diluted solution of the pro-pherulose of iron; the object is to form a ferrous subcarbonate, (See \textit{Lancet}, 5th October, 1844, or \textit{Chemical Journal.}, vol. iv. p. 373.)

\textbf{Physiological Effects and Therapeutic Employment of Iron.}—Iron exists in both plants and animals, as the mammal and birds, constituting an essential part of their fluids and solids; but, incorporated as it is thoroughly with them, it gives rise to none of those phenomena which it occasions when taken externally. Upon the living tissues iron has a tonic influence; and as its preparations greatly promote digestion, they excite the appetite and render more easy the elaboration of the aliment. The vitality of the digestive organs becomes increased from the nutritions principles, and thereby furnish a greater quantity fit to be assimilated.

These beneficial effects are best seen when the medicine is given in small and long-continued doses, or in the greatly diluted state in which iron occurs in the mineral waters or chalybeate springs. On the other hand, chalybeates occasion at times, especially if in large doses, pain of the epigastrium, nausea, febrile excitations, and great anxiety; consequences resulting from the premature production of constitative action, which the preparations of iron make or exercise when they reach the stomach, upon its internal surface, and the nerves which are distributed upon it. The unpleasant effects may generally be avoided by giving it first in very small doses, gradually increased, or by diluting it with some vegetable substance of little activity.

Iron given in large doses, when it reaches the intestines, produces in some persons obstinate constipation, accompanied with a sense of great heat in the lower belly; in others it occasions colics and frequent alvine depotions; while with a third set of persons none of these effects follow its administration.

During the use of iron the faces invariably become blackened, which is caused by the tannin of our food acting upon the iron.

In respect to the secondary effects of iron, the amount of these depends upon the quantity absorbed, and the length of time it has been given. That it is absorbed, in most instances, and carried into the circulation, is proved both by the effects of it being felt over the whole system, and by being distinctly recognizable in the urine on the addition of an infusion of galls. When used for some time, chalybeates increase greatly the power of the heart; the pulse becomes stronger and harder, and in certain cases Observable; the body increasingly enfeebled by disease. If persisted in, they cause increased arterial action, followed by feeble commotion, sense of heat, and hemorrhagic discharges from different parts of the body.

These actions are considered as indications of a phlegmatic habit and sanguine temperament; iron also rouses the absorptive organs when sluggish.

The functions of nutrition and assimilation are greatly heightened by the use of iron; but it be too long persevered in, diseases of over-action ensue, as inflammations, hemorrhages, &c. These symptoms indicate the necessity of discontinuing it.

The preparations of iron are unquestionably efficacious in diseases which proceed from a relaxation of the substance of the living tissues, from an inactivity of the reparatorii or assimilative function, or in case of weakness proceeding from deficient supply of nervous energy.

Hence they are indicated in Anæmia, in convalescence from debilitating fevers, and other tedious diseases, as well as after some of the more acute phlegmasies, as paralysis, the cough remaining after which, if not occasioned by any organic change, is sooner removed by preparations of iron or baux than by any other means. Chalybeates are likewise given in defective menstruation from dulness of the uterus, and sometimes in other cases of menorrhagia, where the sheets are required. Besides being reputed an antidote to the poisonous salts of copper, iron is asserted to prove an antidote to various poisonous poisons.

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These beneficial effects are best seen when the medicine is given in small and long-continued doses, or in the greatly
main edifice and colonades within the court, and giving the exterior the aspect of a fortress,—the propylæa of the Greeks were detached structures placed in advance of the sacred edifice itself, so as to mark very conspicuously the approach to it through the outer enclosure or boundary, they seem to have been intended in some degree to prefigure the temple itself to which they conducted, their general appearance in front being almost identically the same as that of the frontispiece or pediment end of the Attic temple,—a repetition, by the by, and sameness of design do not say so much for invention on the part of the architects, or for the capability of the style employed by them to impress distinct character on buildings of both sorts, is a question which we leave to the gateway conducting to it; unless we would rather suppose that the kind of prefiguration above hinted at was not directly and studiously.

The general arrangement and character of a Greek propylæum may be described as similar to those of an amphitheatre temple [TEMPLE, P. C.], shorter however on its sides than the width in front, and without any cells; yet not entirely open to both fronts, but divided by an inner wall across it from side to side, into two portions, the outer one of which, answering to the proæmas of a temple, was larger than the other; so that the whole may be more bly, if not more intelligently explained, by comparing the plan to the proæmas and apisthodomes of an amphitheatre temple, put together without any intervening cells, being separated only by the two buildings used as many open doorways as there were intercolumnia in front.

Such was the disposition of the propylæum both of the Parthenon at Athens and of the temple at Eleusis, the only two examples I have seen of the kind. It is not however so only by the drawings of it the unedited antiquities of Athens: there were: indeed, as we learn from Pausanias (ii. 5) propylæa at Corinth, but of their architectural design we know nothing. The Athenian structure stands on the west side of the Acropolis, as may be seen by the cut in Furtwängler, P. C. (vol. vii. page 288, col. 2), which shows its relative position to the temple itself—an irregular one, the two buildings not being of the same number in the front. This propylæum, which was begun by the architect Mnesicles in the 4th year of the 85th Olympiad, and completed in five years, is of the Doric order, and hexastyle on both fronts; and the outer or western one was greatly extended by two flanking wings projecting forward at right angles, so as to enclose the platform to which an ascent of steps led up from below, and above which the portico and the two lesser colonades forming the sides of the wings were raised upon three other steps. Thus the platform (78 feet from north to south, by 40 east and west) became an elevated open fore-court, presenting a principal portico in front crowned by a pediment, and two colonades flanking it, on both sides of which the steps began (the others 28 feet high) gave greater importance to the former; and a degree of scenic effect—combination, contrast, and variety—was produced, very unusual in Greek architecture, and which would on a smaller scale have been a kind of the lower flight of steps existed, of which however there now exists no trace, they having been destroyed to make way for a Turkish battery and the approach to the Acropolis. In the second century of the Christian era that first ascent was flanked on each side by an equestrian statue (one of them conjectured by Chandler, from an inscription, to have been that of Agrippa, wherefore it is probable that the other was that of Augustus), which, though later additions to the structure, must have greatly enhanced the general appearance of the architectural ensemble.

The most remarkable circumstances which served to distinguish the Propylæa from a portico is that in the western or outer division there were two rows of inner columns placed not parallel, but at right angles to the front wall. This had the effect of dividing the plan thereby dividing the plan internally into three compartments, the centre one narrower than the other two, and forming an avenue to the principal doorway, which was the largest and longest in the whole temple, and the two end ones the smallest. These inner columns, too, instead of being of the same order as the exterior, were Ionic,—a very remarkable peculiarity, insomuch as it evidences an intention to prefigure the temple itself by the gateway conducting to it; unless we would rather suppose that the kind of prefiguration above hinted at was not directly and studiously.

The Eleusian propylæum resembled that of the Acropolis in nearly all particulars, except that it had no wings attached to it. Like the Athenian temple, it seems to have been intended in some degree to prefigure the temple itself to which they conducted, their general appearance in front being almost identically the same as that of the frontispiece or pediment end of the Attic temple,—a repetition, by the by, and sameness of design do not say so much for invention on the part of the architects, or for the capability of the style employed by them to impress distinct character on buildings of both sorts, is a question which we leave to the gateway conducting to it; unless we would rather suppose that the kind of prefiguration above hinted at was not directly and studiously.

As modern structures presaging of the ancient Greek propylæum character, may be mentioned Capua's Porta Tectum at Milan [CAGNOLA, P. C. S.], and the London Terminus of the London and Birmingham Railway, in Euston-square, which, though only a distyle in antis in both fronts, is a structure which might be said to conduct to the gateway to an unexpected normal.
PRUNELLA, a genus of plants belonging to the natural order Labiate. It has two inferior stamens. The filaments bifold, one branch barren. The anthers 2-celled. The corolla usually tubular, or the lower lip truncate, 3-toothed, the lower lip bifid.

P. vulgaris, Self-heal, is a native of Europe and Asia, very common in Britain. It is an English plant.

The leaves are stalked, ovate or oblanceolate, orifice truncate, 3-lobed, the upper lip of the calyx with short truncate mucronate teeth, the lower lip with ovate-lanceolate mucronate teeth. The stem is almost upright, glabrate, straight, and has a very strong and pungent root at its apex. The flowers are purple, white, or nearly red. In the British specimens the leaves are nearly entire. This plant is considered astrigent, and was formerly used in forsythia for asthma and inflammation of the faucets. Its reputed use is now merely in name.

P. grandiflora has petiolar ovate leaves, quite entire or toothed, the lateral teeth of the upper lip of the corolla lanceolate, the corolla larger, more than twice as long as the calyx. It is native throughout Europe in woods and shady places; the flowers are of a purple or violet colour, seldom white. All the species of Prunella are showy when in blossom, and are therefore worth cultivation in flower gardens and rock-work. They grow in any common garden soil, but thrive best in a damp moss situation. They are readily propagated by seed or division.

(From Mrs. A. M. Pethick's Botany. New British Botany; Lindley, Vegetable Kingdom.)

PRUSSIC ACID—Medical Properties of. This acid, termed also hydrocyanic acid, has been described according to its discovery by Liebig in P.C.: Its employment may be described by its connection with medical jurisprudence, from the frequent use of it in cases of death, accidental or intentional, merit the most attentive consideration. But these are unsuiting for popular discussion. A few important rules and cautions can alone be furnished here.

Much variation in strength exists in the acid (that is, the dilute acid, for the anhydrous is always of definite strength), owing to the different modes of preparation, and does a difference of strength exist in the acid as it is enjoined to be prepared by the Edinburgh and London colleges, but even in England two preparations are commonly met with, that enjoined by the London Pharmacopoeia, which contains 2 per cent. of real acid, and that which has been long known as Scheele's, containing 4 per cent. The substitution of the one for the other in preparing a prescription might lead to serious if not fatal consequences. A still greater difference exists in the strength of the preparations met with in different countries of the Continent. No one in travelling should ever prescribe prussic acid, unless he has previously ascertained what preparation will be employed in compounding the prescription.

As it undergoes decomposition by time, especially if exposed to the air at a high temperature, it should be kept in the dark, and in a cool place. As it is specifically lighter than water, it rises to the surface in watery fluids. The fluid in which it is kept should be well stirred before pouring it out. When employed externally as a lotion, in which case it is used in larger doses than when meant for internal employment, great care should be observed to distinguish it, lest it should be accidentally taken internally. Even its external employment demands great care, for when the cuticle is abraded or cracked, it is readily absorbed, and may prove fatal. The cuticle, even when in a state of integrity, is not proof against the vapour of prussic acid. It is a well-known fact that the body should be kept well corked, as the vapour is the most potent form which can influence the human frame.

When first introduced into medical practice, high expectations were formed from it, but the experience of Frederick and other eminent medical men has moderated these expectations; but there is no doubt that it might be found useful in many instances where it is not employed, the dread of accidents deterring many from the use of it. It is now known that the effects produced by the vapour and the fumes are chiefly due to the action on the mucous membranes, after the active stage is passed, or those of irritation. Among the former, hooping-cough is unquestionably benefited by it. But here great caution is necessary. Its premature employment, by checking the cough, induces inflammation, often of a very alarming kind. The dose should at first be very small, and most slowly increased. In some cases, even emanating from medical men, large doses are most culpably administered. If the calyx is absent in the fre-
species are small trees or shrubs, natives within the tropics; they are very numerous and intricate.

P. erectus has a hemicryptophyte, stemmed branched root with a slender axis, and a thick friable back. It is an erect simple hairy under-shrub, with oblong acuminate leaves narrowed at the base, membranous ciliated, rather phloifaceous; stipules short, bifoliate, the flowers 2-4 in a fascicle, sessile, bracteolate, terminal, and axillary. This species is accounted poisonous in Brazil; it is known by the name of Erave de raiz, and is used for the destruction of rats and mice.

P. speciosa is employed in Brazil in the same diseases as sarsaparilla; and P. tinctoria forms a fine red dye much valued in Peru. All the species of Psychotria are of most easy culture and propagation. They grow best in a mixture of loam, peat, and sand, and cuttings will strike root readily if planted in sand underneath a glass-frame. Some of them bear handsome foliage, but the flowers of all are insignificant.

(Don, Gardner's Dictionary; Lindley, Flora Medica; Lindley, Vegetable Kingdom.)

PTARMICA, a genus of plants belonging to the natural order Asteraceae. It has a campanulate involucre with the scales brown and scarious at the edge. The receptacle is flat or scarcely convex, bristly, and covered with scales. The flower from 6 to 20, flat, expanded, much longer than the involucre. The achenes are bidentate, obovate, the outer one somewhat winged at the edge.

P. elegans has a widely creeping root, very difficult to extirpate when the soil is moist. Upright stems about two feet high, angular, smooth, hollow, leafy, with small axillary rudiments of branches corrymbosum at the top. The leaves are sessile, linear, or slightly lanceolate acute, very minutely serrated with bristly teeth. Smooth on both sides and a dark green. The flowers are mill-white, larger than most others of the same genus. The whole plant is pungent, and probably contains an active principle that causes irritation, but this is thought to be owing to their little sharp marginal teeth: the root is aromatic. The heads of P. nova, atrata, and moschatula are used in the Swiss Alps as a substitute for tea. Moschatula is the basis of the aromatic liqueur called Esprit d'iva.

(Lindley, Vegetal Kingdom; Lindley, Flora Medica.)

PETERCHITHYS, a singular genus of fossil ganoid fishes from the old red- sandstone of Scotland and Orkney. (Agassiz.)

PETER/NEA, a fossil genus of Conichthir, allied to Aviculo, and bitherto confined to the Palaeozoic, and chiefly found in the Devonian strata. (Goldsmith.)

PETERS (from spiras, a wing), a genus of plants belonging to the natural order Filices. The thecm arise from the points of veins placed on a nerve-like receptacle running along the edge of the leaf, forming an uninterrupted marginal sori; the involucres are continuous with the edge of the leaf, scarious, and opening inwards.

P. aquatica, common Fern, or Bracken, is the most abundant of our British species. It has a long tapering creeping rhizome, externally black. The leaves are erect, from one to six feet high, repeatedly compounded with horizontally spreading divisions, whose ribs are smooth; the primary leaves are nearly opposite, the lower ones more acute, pinnatifid segments oblong, obtuse. They are all of a light bright green colour, slightly brown at the edge, which is revolute and crispis, or wavy, sheltering the dense linear masses of tawny hairs below, the cuticle smooth, greyish, not wounding the hands severely if plucked incrustaneously. When cut across, the rhizome has a branched appearance resembling a spread eagle, whence the Latin name. There is scarcely any scent from it in the United Kingdom where this plant does not make its appearance. It is said to be indicative of poor soil, but it is more probable that its presence on cultivated ground is attributable to the effects of the frost and mildew, rather than to the quality of the soil. The geographical range of this species is very extensive; it is included in every European list, and is found also in Asia and America. It is used for thatch, for many parts of England and Scotland for manure, and in the West Indies for the same purpose.

The people gain considerable profit by collecting the leaves, and selling the ashes to soap and glass makers, on account of the large quantities of alkalies contained in them. The leaf is better for horses, braces or fern is in great request in Wales, Scotland, and Ireland, and when chopped up with hay they are sometimes fed upon it. In Invernesshire the poorer classes thatch the tops of their thatched houses with the leaves, which, although not durable covering, pigs are fed upon the roots boiled down into a mucilaginous mass. This species is the Filix fontana of our older authors. It is likewise the pteridium of Theophrastus, Hist. Pl. 9, 15, and of Dioscorides, 4, 184. The ancients are said to have used both the rhizomes and fronds of this fern in decoctions and diet-drinks, in chronic disorders of all kinds arising from obstruction of the visera and spleen. Some modern authors give it a high character of the same property, but it is now seldom used by medical practitioners. In haller's time its reputation was very extensive as a destroyer of worms, and a bed of the green fronds was esteemed a sovereign remedy. It is said in children to be astringent that in some places it is used for tanning and dressing red and chamois leather. It has been employed as a substitute for hops, and in the Canaries a miserable sort of bread is made from it. The root is still used in decoctions.

(NEWMAN, British Ferns; Babington, Manual of British Botany; Lindley, Flora Medica.)

PEROCATRUS (from spiras, a wing, and adraps, a fruit, in reference to the pods being girdled with a broad wing). It has a 5-cleft calyx, a corolla with 5 petals, disposed in a papilionaceous form; 10 monadelphous or diadelphous stamens, an irregular indescriptive legume, somewhat globular, surrounded by a conical scale, the calyx of the middle 3-celled. The leaves are unequally pinnated. The racemes axillary, or forming terminal panicles. The species are unarmed trees or shrubs.

P. Draco, Dragon's blood Pterocarpus, is a tree nearly 30 feet high, with alternate shining leaves, about 5 on each side, and an odd one, rather obtuse, entire, veined, smooth, pale green below; the legumes nearly smooth. The wood of this tree is white and heavy, the bark thick and of a rustcoloured, grey colour. When first cut it presents no marks of redness, but in a little time red drops of juice begin to collect and exude from the wood. If left in the sun for about ten minutes and clear, and collected, it is called the dragon's blood, and is obtained from the leaves of sanguis draconis, or dragon's-blood. This resin formerly constituted an extensive article of commerce from Carthagena, but from its diminished consumption its collection has ceased. The dragon's-blood obtained now in the market is the produce of Calamus Draca.

P. sanguinum is a tree with a very high trunk, scarcely ever found straight. The bark has a brown outer coat which is thin and spotted with black dots in flakes, the inner bark, which is flabby, red, and astringent. The branches are numerous, horizontal, and spreading. The leaves subbifarious, alternate, pinnate, with an odd one, 8 or 9 inches long. The panicles are terminal and very large, ramifications bifarious. The flowers are very numerous, white, and with a small spot of yellow in the centre. The bracts small, caducous, solitary below each division and subdivision of the panicle. The seed is solitary and kidney-shaped. This tree is thought by Roxburgh to be the one yielding gum hino, a well known astringent,—the juice hardening into a dark red and very brittle gum resin, which, on being powdered, changes to a light brown, not unlike Peruvian bark. Its taste is strong, but simply astringent. The real kino-tree however appears to be the next species.

P. erinaceus is a tree 40 or 50 feet in height. It has uniquely pinnate leaves, smooth above, downy beneath; from 11 to 15 leaflets, alternate, distant, on short stalks, ovate, oblong, obtuse, or margined, wavy at the edge; lanceolate stipules, solitary or clustered racemes, downy from the old wood below, the cuticle smooth, greyish, not wounding the hands severely if plucked incrustaneously. The flowers are yellow, the legumes stipulate, compressed, membranous, velvety, serrated, and undulated, prickly on the centre. When the branches are wounded, a clear bright red gum exudes from the inner me, and is mentioned as such by Mr. Mongio Park. It is
a very powerful remedy in obstinate chronic diarrhoea and dysenteries, and in all diseases arising from laxity of tissue. In many cases it is applied as a purgative to check hemorrhage from wounds and ulcers, and to diminish discharges.

P. sanctusibus is a lofty tree having alternate stalked leaves, peltate alternate, leathery, smooth above, and untoothed beneath. The flowers are axillary, solitary, or branched, and erect. The legume roundish, stalked, falcate upwards, compressed, smooth, keeled on the lower edge, the keel being somewhat bifurcated. From its colour the wood is obtained. The Red Sandal-wood, a timber chiefly used by dyers and colour manufacturers of the present day, but which is also used to colour several official preparations, such as compound tincture of mercurial water forms, its beautiful coloured precipitates with many metallic solutions.

P. flavus is the yellow sandal-tree, and is used for dyeing yellow. Its bark is very bitter.

The species of this genus thrive best in a loamy soil, and young cuttings not deprived of their leaves root readily in sand under a glass in heat.

(Dorn, Gardiner's Dictionary; Lindley, Flora Medica; Barnett, Outlines of Botany.)

PETROPHIUS, a genus of fossil Cyczandaceous plants from the oolite of Yorkshire and beds of the same age in Scania. (Brongniart.)

PETIOLO DORSUM, a genus of fossil corals from the Silurian strata of Salop, Westmoreland, and Tyne. (Loudon.)

PETRACANA THUS, a genus of fossil placoid fishes from the old red and mountain limestone strata. (Agassiz.)

PETRUM, 1200, a genus of Copephlopa from the fault of Folkstone. (D'Orbigny.)

PETRASCHUS, a genus of fossil fishes from the Cretonaceous system of England. (Agassiz.)

PETROYCHIUS, a genus of fossil ganoid fishes from the Eias of England, &c. (Agassiz.)

PUBLIC HEALTH. On the 14th May, 1838, the Poor Law Commissioners presented to Lord John Russell, then Secretary for the Home Affairs, a Report by Dr. Arnott and Dr. Kay, and two Reports by Dr. Southwood Smith, relative to the prevalence of disease among the labouring classes in certain districts of the metropolis. The House of Lords having, on the 16th of August, 1839, presented an address to her Majesty requesting her to direct an inquiry to be made as to the extent of the causes of disease mentioned in those Reports, the Poor Law Commissioners received a letter from Lord John Russell, in which he stated that her Majesty required them to make such inquiry, not only as to the metropolis, but as to other parts of England and Wales, and to prepare a Report stating the result of such inquiry.

In 1840 the subject was investigated by a Committee of the House of Commons, the result of which was a Report 'On the Health of Large Towns and Populous Districts.' In 1842 a Supplementary Report on the Sanitary Condition of the Labouring Population of Great Britain, by Edwin Chadwick, Esq., 'Local Reports on the Sanitary Condition of the Labouring Population of England,' were presented at the same time. Of these local Reports there were twenty-six, some of which relate to certain counties and others to particular towns. At the same time were presented Reports on the Sanitary Condition of the Labouring Population of Scotland.' In 1843 a 'Supplementary Report on the Results of a Special Inquiry into the Practice of Interment in Towns,' by Edwin Chadwick, Esq., was presented. On this subject see some remarks under INTERMENT, F. C. S.

On the 9th of May, 1843, Commissioners were appointed by the Queen for the purpose of 'inquiring into the present state of the working population of the various districts in England and Wales, with reference to the causes of disease among the inhabitants, and into the best means of promoting and securing the public health, under the operation of the laws and regulations established for the purpose at present prevailing with regard to the drainage of lands, the erection, drainage, and ventilation of buildings, and the supply of water, in such towns and districts, whether for purposes of health, or for the better salubrity and safety of their dwellings, may be promoted by the amendment of such laws, regulations, and customs.'

The first Report of the Commissioners was presented to both Houses of Parliament at the end of June, 1844. The report was accompanied by 437 folio pages of evidence on which the Report is founded, an Appendix of Special Reports on the sanitary condition of several towns, among the most important of which are—Liverpool, by W. H. Duncan, M.D.; Ashton-under-Lyne, by John Ross Coulthart, Esq.; the City of York, by F. W. Laycock, M.D.; and Nottingham, by Thomas Hawkesley, Esq., resident medical officer to the supply of water, on the Obstacles to Improvement in the Structure of Buildings, in the Cleansing of Streets and Houses, and in the Provision of Sewers and Seeders.

The Second Report of the Commissioners was presented to Parliament in February, 1845. It treats briefly of the Causes of Disease, and at considerable length of Remedial Measures. It is followed by a report on the means for rendering houses fit for human habitation, and by a recommendation for the regulation of the number of persons to be housed in various other towns, by R. A. Slaney, Esq.; a Report on the State of Bristol and other Towns, by Sir Henry T. de la Beche; a Report on the State of Large Towns in Lancashire, by Dr. Lyon Playfair; and a Supplement containing information on sewers, lodging-houses, and other matters connected with the interests of the Commissioners.

We have thus briefly stated the origin and progress of this important investigation into the sanitary condition of the population of Great Britain, chiefly indeed of the labouring and poorer inhabitants, but extending indirectly to all classes. Other agencies for improving the physical condition of the labouring classes are among the projects of the poor rate. Among these is the 'Health of Towns' Association,' of which the Committee includes noblemen, dignitaries of the church, members of Parliament, and other gentlemen. They have published a series of lectures on the Unhealthy Towns, its Causes and Remedies, delivered at Derby Hall, London, by William Augustus Guy, M.B., Physician to King's College Hospital; and 'Lecture on the Unhealthy Towns, its Causes and Remedies, delivered Dec. 10, 1845, at the Mechanics' Institute at Plymouth, by Vice-captain Ebrington, M.P.;' and a 'Report of the Committee to the Members of the Association, on Lord Lincoln's Bill.' (Lord Lincoln's Bill was introduced into Parliament at the close of the session of 1845.)

These important inquiries have proved by undeniable evidence, that the districts inhabited by the labouring classes, and often by tradesmen, in large towns, in many small towns, and in several parts of the country, are in a very noxious state, from want of drainage, want of cleanliness, imperfect ventilation, deficiency of water, and density of population; the consequences of which are great frequency of sickness, and excessive destruction of human life. Typhus fever, cholera, consumption, scrofula and other chronic complaints, mostly arising from causes which might have been prevented, are found to exist to an extent which it is painful to contemplate. The causes of sickness are generally most numerous and most intense in the crowded districts, and the mortality is found to be, with some qualifications, in proportion to the extent of popu-

lation. In the metropolis, for instance, the annual mortality is 3% per cent. in Whitechapel, but only 2% per cent. in St. George's, Hanover Square. In the district of Bethnal-Green, 57 houses of the population of the parish were closed in 1841; and in some cases there were 30 persons in a single house.

Of fifty towns which were visited by direction of the Commissioners, only eight were found to be in a tolerable state as to drainage and cleansing; and as to the supply of water the reports were still more unfavourable.

The annual average mortality in England is 2'207 per cent., or 1 in 45. In healthy districts it is 2'2 per cent., or 1 in 45. In the metropolis the deaths are 1 in 39; in Birmin-

gham and Leeds 1 in 37; in Sheffield, 1 in 33; in Bristol 1 in 32; in Manchester, 1 in 30; in Liverpool 1 in 29. In Brussels they have been found to be 1 in 24. The mortality was found to be greatest in the regions nearest the sea, in East Kent. By the return made to the Town Council of Liverpool in 1841, by their surveyors, it appears that there were then 2398 courts, which contained a population of 68,354 persons. In these courts 195 people were found to die within the year, or 240 per 1000 of the population. From the mortuary registers of the metropolis for 1824, the ages at death of the gentry, the tradesmen, and the working classes, who died at the age of 15 and upwards, Mr. Guy ascertained that the life expectation lived 50 years, and the working classes 48. In 1844 the deaths in the metropoli-

polis were 50,423. If the rate of mortality had been 1 in 50.
instead of 1 in 39, the deaths would have been only 40,145, thus giving a saving of 10,278 lives in one year. From a Report of the Registrar-General it appears that out of every million inhabitants in the metropolis, not more than 17,398 die every year in the large towns, and only 19,380 in the rural districts.

The large towns have already begun to make improvements. The improved drainage in twenty streets of Manchester is calculated to diminish the annual number of deaths by more than 20 in every 110; and similar results of structural improvement have followed in other instances.

The loss of life, and the pecuniary charges consequent upon it, are far greater than is generally supposed. The poor are not the only considerations to be attended to. Not only the sickness which precedes death, but the sickness which is caused, renders the sufferers incapable of following their usual occupations, and often prevents them from attending to the wants of the parish, and from public and private charity. It has been shown that pecuniary saving would result from sanitary improvements to such an amount as to justify the action of the legislature, if it were only from motives of public economy.

The power vested in the Court of Chancery by ancient usage is resorted to in a few towns for the abatement of minor nuisances. Mr. Coultart gives a detailed description of the various matters which have been taken cognizance of by the best judges at Assonnder-Lyne with beneficial effect. In most places, however, the exercise of these powers has fallen into desuetude, even where the courts still continue to be held.

2. The question of adoption in order to improve the sanitary condition of large towns and populous districts are comprised under the following heads:—

1. Drainage, including house and street drainage, the drainage of any place not covered with houses, yet influencing the health of the inhabitants.

2. The paving of streets, courts, and alleys.

3. Cleansing, comprising the removal of all refuse matter not carried off by drainage, and the removal of nuisances.

4. A sufficient supply of water for public purposes and domestic use.

5. The construction and ventilation of buildings in such a manner as to promote rather than injure the health of the inhabitants.

The Second Report of the Commissioners gives Thirty Recommendations to the legislature, each of which is preceded by the reasons on which the recommendation is founded. We can only afford space for a summary of some of these recommendations.

No. 1. Recommends that in all cases the local administrative body shall have the special charge and direction of all works required for sanitary purposes, but that the crown shall possess the general power of supervision.

No. 2 to 11 relate to Drainage; surveys and plans; definition of area for drainage by the crown; appointment of surveyors, investigators, etc.; authority of persons connected with drainage; management of the drainage of the entire area by one body; purchase of rights of mill-owners and others; construction of sewers, branch sewers, and house-drains; rating of lands; drainage of houses in separate apartments; when the rent is collected more frequently than once a quarter, or when the yearly rent is less than 10l.; provision of funds by the local administrative body, distribution of cost among the owners of the properties benefited, and charge of house-drains on owners of houses to which they belong; power to raise money, and provision for gradual liquidation of debt incurred.

No. 12 recommends that the Paving be under the same management as the drainage; but that it be performed by the local public officers.

No. 13, 14, and 15, relate to the Cleansing of all privies and privy closets, and of the streets and courts and due notice; removal of large collections of dung; and abatement of nuisances arising from noxious exhalations from factories.

No. 17 to 21 relate to the supply of Water, in sufficient quantities not only for the domestic wants of the inhabitants, but also for cleaning the streets, scouring the sewers and drains, and the extinction of fires; purchase of the interests of water-companies, and placing the management of the supply of water within the control of the persons who contract with the public; establishment of public baths and wash-houses for the poorer classes; and especially recommending that the supply of water in the towns be not only constant, but at as high a pressure as is circumstances, and that the water shall be of wholesome quality.

No. 22 to 26 are regulations for Buildings, including power to raise money for the purchase of property, for the purpose of opening thoroughfares, and widening streets, courts, and alleys; prohibition of use of cellars as dwellings, except when they are of certain dimensions and properly ventilated; provision for building all new houses with proper privies, and for a good system of ventilation in all edifices for public assembly and residence; and regulations for the construction and issue rules for regulation of lodging-houses for the reception of vagrants, trampers, and persons of similar wandering habits.

No. 27 and 28 recommend that power be given to the local administrative body to compel landlords to cleanse houses only reported to be in a noxious state from filthiness; and that power be given to the mayor, magistrates, and corporation to issue rules for the cleansing and maintenance of the pavement along the streets, and for the use of muck as a boundary. These regulations are of an important nature, and are to a great extent in accordance with the practice already established in London. The multiplicity of regulations gives them an advantage over them, and the improvement of the sanitary condition of the city has proceeded in a systematic manner.

No. 29 recommends the appointment of a medical officer in each town or district; and shall report periodically on the sanitary condition of such town or district.

No. 30 recommends the establishment of Public Walks, and that the local administrative body be empowered to raise the necessary funds for the management and care of the walks when established.

A large portion of the 'Report of the Committee on Lord Lincoln's Bill,' before mentioned, is occupied with showing that the supply of water, wherever practicable, should be constant, not only in the main pipes, but in the branch-pipes, thus doing away entirely with the use of water-huts; and demonstrating that in most cases such a constant supply is not only practicable but economical, and that it would contribute in the highest degree to the cleanliness of houses in crowded districts, and consequently to the health of the inhabitants.

PUBLIC POLICY. This expression sometimes occurs in the reports of public bodies, and seems to have a meaning somewhat less definite than the expression 'policy of the law' occurs. But of these expressions has a sufficient meaning. An example will explain how they are used. One man may agree with another for a certain valuable consideration to enter into a contract to carry on some trade, art, or business in London, and agree that he will not carry on the same within the realm of England. The object of the bargain is to secure to him who pays the money all benefit which may be derived from it. But he who has received the money may happen to break his contract by commencing the same trade, art, or business in a distant part of the realm as the 'Land's End or Newcastle-on-Tyne,' the original place of his business, or business being supposed to be in London. Now if an action were brought on such a contract, it could not be maintained, and the reason would be that the contract was against public policy, which would be explained to mean that the public ought not to be deprived of a man's services by such an unreasonable contract. Yet it would be said that if the contract were that the man who received the money should enter into trade, art, or business within a certain limited distance of London, the contract would be valid. This would imply that the public of a given district may be deprived of a man's services in another individual, not a reasonable grant, but that he may receive the full benefit of his contract. It would be a more consistent conclusion to declare the contract altogether invalid, if reasons of public policy, as they are called, are to be held to invalidate a contract, it is a question of the validity of the contract. But the administration of the contract is valid if it applies to a limited district, contains by implication a better reason for declaring the contract in its full extent to be invalid than reasons of public policy. The applied assumption is, that the person who pays the money is entitled to the full benefit of his contract and no more. If then it shall appear that he can sustain no real damage by the receiver of the money carrying on his trade, or art, or business at a remote place, that is a sufficient answer to his complaint. (Horner v. Graves, 7 Bing. 743.)

Still it may be said that there are contracts which ought to be declared void for reasons of public policy. If, for example, the correct expression of Lord Hardwicke, reasons of public utility (Earl of Chesterfield, &c., versus Sir Abraham Jannen, 2 Ver. 156), Lord Hardwicke observes, 'Particular persons in contracts shall not only transact particular fide in fact, but shall not transact molà fide in respect of other persons, who stand in such a relation to either as to be affected by the contract or the consequences of it; and as the rest of mankind besides the concerned, it is governed by public utility.' He gives as an instance 'premises contracted to be given for preferring or recommending to public office or employment; none of the parties are damaged, but the holders suffering the money may in these cases be or may be received thereby.' We may suppose a case in which the person recommended is a fit person, and no damage is caused by the bargain to give a premium.
But then it may be urged, as Lord Hardwicke would argue, that damage to the public service may be caused by such bills; and it may be said that it would be reasonable to presume that the possible damage to the public service is perhaps not the best ground on which to assume the invalidity of such bargains. If the person who has the appointment to a public service, is not appointed by a contract of employment, he is not a public servant. The same reason is equally applicable to any other person whose recommendation may help another to an office, for by the supposition the office is not a thing that can be the subject of bargain. Next, the term in the eye two disks of white paper about half an inch in diameter (or on a white ground, as a wall, place two disks of black paper), the disks being from three inches to two feet distant from a person to the front: then, standing with the right eye directly before the left hand disk, at a distance from it equal to five or five times the interval between the disks, and closing the left eye, look with the right at such object; it will be found that the right hand disk is invisible, in consequence of the light from it falling on the spot in the eye at which no image is formed. The left hand disk would disappear if the spectator, closing his right eye, should stand with his left eye directly before the right hand disk.

The experiment may be varied by standing with the right eye directly before the right hand object, then closing the left eye, and looking, without turning the head, obliquely at the left hand disk; the disks are small, the left disk yellow. It is found on moist sandy heaths in Great Britain. This species is the common Flees-bane; so called from its being disliked by vermin and used to drive away fleas. P. dysenterica has a creeping root, and is a herb more or less woolly or cottony, glabrous, and with a peculiar and aromatic smell. The stem rises 12 or 15 inches high: it is round, leathery, cottony, corymbose at the summit, with many bright yellow flower-heads, whose disk is of a darker hue than their numerous spreading rays. The leaves are acute, veiny, and wrinkled, or slightly toothed or serrated, from one to two inches long, sessile, clasping the stem, under the side cottony. The fruit is bristly and ovate, the pappus rough, the receptacle slightly cellular, unequalled toothed or scaly. Linnæus states, on the authority of General Keith, that this plant cured the Russian army of the dysentery. But Haller speaks contemptuously of the medicinal virtues of this plant, because he says it abounds in earthy matter. It is found in damp places in Great Britain.

(Burnett, Outlines of Botany; Lindley, Flora Medica; Lindley, by the author's death.)

PULMONARIA (so named from its being supposed efficacious in disorders of the lungs, or from the spots on the leaves resembling those on some diseased lungs), a genus of plants, includes the natural order of Pulmonaria. P. tuberulosa is a tuberous, a tubular, 6-calyx, a funnel-shaped corolla with a naked throat. The stem is attached to the tube filaments very short. The style is simple, the nectar smooth, attached by the top, the tube forming a common tube to the corolla, and terminal corymbose racemes of flowers.

P. officinalis, Langworth, has ovate leaves, roundish or cordate, the upper leaves oblong. The root is thick and black. The corollas are red before expansion and then purple. The whole plant is more or less hispid. It is found in the woods and thickets of England, and is native of Europe and the Caucasus. The leaves, which are the parts of the plant recommended in medicine, have no peculiar smell, but in their recent state manifest a slightly astringent and mucilaginous taste, which they are supposed to be demulcent and pectoral, and have been prescribed in consumption. All these plants contain nitre in considerable quantities, and when burnt this species yields one-seventh of its weight in ashes. In the root of Europe's eosin, a post and according to Ray in his time it was brought to table in Scotland.

P. angustfolia has all lanceolate leaves. It is difficult to distinguish from the former species, but is more pubescent, and is without hispid leaves. The root is purple, and there is a variety with white flowers. It is native of Russia. P. officinalis is a native of Europe and the Caucasus. All the species of Pulmonaria are pretty plants when in bloom, and are desirable for gardens on account of their early flowering. They are very easily cultivated, and will grow in any common garden soil: they are readily propagated by division. Most of the species grow well under the drip of trees and in moist situations.

(Deane, Dictionary of Botany; Dalington, Manual of British Botany; Burnett, Outlines of Botany.)

PUNCTUM CAECUM, in the eye, is the part of the surface of the retina which is immediately about the spot at which the light is focused by the medium of the eye. At this spot the retina has not sufficient delicacy of fibers to receive impressions from the rays of light which, coming from external objects and converging there, should form images of those objects: consequently the part contributes nothing to the perception of vision.

Its existence in each eye is proved by a well-known experiment, which was first made by Marriette:—on a dark ground, as a black sheet of paper or black cloth, place a vertical pin in the eye two disks of white paper about half an inch in diameter (or on a white ground, as a wall, place two disks of black paper), the disks being from three inches to two feet distant from a person to the front: then, standing with the right eye directly before the left hand disk, at a distance from it equal to five or five times the interval between the disks, and closing the left eye, look at the right at such object; it will be found that the right hand disk is invisible, in consequence of the light from it falling on the spot in the eye at which no image is formed. The left hand disk would disappear if the spectator, closing his right eye, should stand with his left eye directly before the right hand disk.

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(Burnett, Outlines of Botany; Lindley, Flora Medica; Lindley, by the author's death.)

PURCHASE, which is corrupted from the Latin word Persuasio, is defined by Littleton (r. 12) to be 'the possession of lands or tenements that a man may hold by a deed of agreement, unto which possession he cometh not by title of descent from any of his ancestors, or of his cousins (consanguineus), but by his own deed.' Purchase as thus defined has been comprehended in land by deed or agreement, and not by descent; but it is not a complete description of purchase, as now understood, for it omits the mode of acquisition by will or testament, which however, is the cause, when Land is purchased. It was species of purchase, as the power of devising lands did not then exist, except by the custom of particular places. Blackstone makes the following enumeration of the modes of purchase—Eschat-Ocupancy, Prescription, Forfeiture, and Alienation. As to eschaton, there is some difficulty in the classification, as the title appears to be partly by descent and partly by purchase; and alienation is here used in a larger sense than that which his term has in the Roman law, in which it does not comprehend acquisition by testament. Generally then, purchase is any mode of acquiring lands or tenements, except by Deed.
PYRANIS, a genus of Gasteropods, which includes two species, was found in the U.S. by an Austrian visitor near Holborn Bridge. (Brown, *Manch. Geol. Trans.*)

**PYCRETHRUM** (from wexl, fire, because of the hot taste of the root), a genus of Composite plants belonging to the tribe Asteraeae, contains the essence of the oenanthe, the receptacle flat or convex. The fruit angular and not winged. The pepus an elevated membranous border.

*P. Parthenium, Ferfewer,* has stalked pinnate leaves, with oval acuminate segments, a hard yellow-green, the leaflets incise to ovate decurrent and cut. The flower-heads are erect, about half an inch broad, with a convex yellow disk, and numerous short broad abruptly 2-ribbed white rays, often wanting, sometimes multiplied, and the disk being obliterated constituting a double flower. The whole plant is bitter and strong scented, reckoned tonic, stimulating, and anti-hysterical. It was once a popular remedy in ages. It is said that the oil is peculiarly disagreeable to bees, and that these insects may be easily kept at a distance by carrying a handful of the flower-heads. It is common in many parts of Europe and in England.

*P. acanthum* has sessile pinnate leaves, with ovate pointed segments. A branched stem, solitary heads, the involucral scales lanceolate obtuse; the fruit rugose with two round glandular dots on the external face just below the cypselae, and a border. It is found in fields and waste places in Great Britain.

*P. maritimum* has sessile doubly pinnate leaves, with fleshy segments, convex above, keeled beneath. The stem digitate, covered with tomentum. The flower-heads are oblong, about one inch broad, with 2 elongated glandular spots on the external face, just below the elevated lobed border. It is found on sea-shores in Great Britain.

Ithaca is the Pellessi of Spain, once much esteemed as a sialogogue, and resorted to for relief in toothache. Oake says that when the root of *pycrethrum* is chewed, it makes a sensible impression on the tip, which continues like the flame of a candle more powerful five or ten minutes after.

When extracted, the acrid oil contained in the root is said to be serviceable in cases of palsy, and when cutaneous action is required, as a liniment. Ainslie says it is administered in typhoid fever by the Indian practitioners. (Burnett, *Outlines of Botany; Linley, Flora Medicia; Balfington, Manual of British Botany.*)

**PYRINA,** a fossil genus of Echinodermata proposed by De Moulins for the Nucleolites depressus of the green-sand.

**PYRONE** is a term very recently applied to the electric fluid, derived from the Greek word word *pyros,* fire. The views of Mr. Lake, who first proposed it, a short time since, are novel, and certainly deserves consideration. He submits the change of name *because there appears to be a degree of indefiniteness in the terms electricity, electric fluid,* &c., and hoping that he has produced sufficient evidence in support of its materiality and existence, he states that he is ready to adopt the latter name.

**It might be an advantage if this or some similar name were adopted.** Electric might have been used, but as the fluid has no more connection with amber (**quarzo**) than many other substances possessing like properties, he has chosen to propose an entire change of name; and as it bears the greatest resemblance to fire, and seems to have a most intimate connection with that element, the word Pyrone is submitted.

He maintains, in the first place, that as electricity produces mechanical effects upon matter (for instance, reduces the strongest oak to splinters, and some substances into powder), that it is owing to water having been introduced by the action of fire. He states that when the latter is ignited, the moisture is driven off, and that the water is not the real agent. This is clearly shown in the following experiment.

Experiment 1. A size of iron wire (No. 26) was attached to the terminal wires of the battery. The positive was first immersed in the solution, and the circuit completed by the immersion of the negative wire. The latter burned with a beautiful reddish flame. This would seem to result from the following cause: hydrogen and pyrone being released at the negative pole on the decomposition of the water, and the oxygen of the acid having a greater affinity for these than for sulphur, the acid is decomposed, the negative element is oxidized, the hydrogen and pyrone released gas combining with the hydrogen and pyrone, combustion (ignition) takes place. When the experiment is reversed, and the negative wire first brought into the solution, the circuit being completed by the positive wire, the latter became red-hot to the extent of an inch and a half under the solution. This resulted from the accumulation, as it is called, at the poles of the unconnected pikes, rendering the pyrogenic current more powerful at first, and increasing the temperature during its continuation. No flame appeared at the positive pole, there being no hydrogen present, all that obtained having escaped at the negative electrode.

**Experiment 2.** A platinum plate, an inch long by half an inch wide, being attached to the negative wire, and a small iron wire at the positive, the platinum being first immersed in the solution, and the circuit completed by the positive wire, it became red-hot an inch and a half under the solution, as in the last experiment, and from the same cause; but when it was only brought into contact with the solution it fused, which was prevented when it was immersed in a little nitric acid.

**Experiment 3.** When the iron wire was placed at the negative end of the battery and the platinum at the positive, the platinum being first put into the solution and the circuit completed by the positive wire, it became red-hot an inch and a half under the solution, as in the last experiment, and from the same cause; but when it was only brought into contact with the solution it fused, which was prevented when it was immersed in a little nitric acid.

**Experiment 4.** A fine copper wire was attached to the positive terminal, and a platinum wire to the negative. The platinum being as usual first immersed, and the circuit completed by the insertion of the copper wire, the latter was heated an inch under the water. The cause of there being no flame is the same as in the former experiments, for the copper wire being at the negative electrode, no hydrogen was present to produce it. But when the experiment was reversed, and the copper wire introduced at the negative pole and the platinum at the positive, the latter being first immersed and the circuit completed by the former, the copper or negative wire burned with a bluish flame, oxygen and hydrogen being formed, as before, but at the opposite pole.

**Experiment 5.** A slip of zinc was used instead of copper wire, and with the same result; for when placed at the positive termination, and the platinum at the negative, and the latter immersed in the solution, no flame was produced at the negative pole, but the hydrogen at the positive, the latter first immersed, the zinc at the negative burned with an intense purple flame, hydrogen being present, as before, at the other pole.

**Experiment 6.** With platinum at the positive and sulphur at the negative, the platinum being first
immersed, the antimony or negative electrode fused and inflamed, depositing on the glass and surface of the solution an orange-coloured powder resembling Kermes' mineral. When the same process was tried on potassium, the negative and the latter first immersed in the solution, white fumes were given off by the sulphuret, but it was not ignited, for, as in the preceding experiments, there was not any hydrogen at the negative, and some others; for when any of these are united as an amalgam with mercury, and exhibited in this state to ammonia, an amalgam of mercury and the bases of ammonia is formed, and the fixed alkalies or earths are reproduced, the first amalgam having absorbed the pyrogen and oxygen of the second.

In explaining the experiments of Messrs. Schönbein and Gann with ozone, Mr. Lake deduces that zinc, nitrogen, and hydrogen are not simple bodies. He draws this conclusion as regards the metals from the different colours of the flames in the experiments of Messrs. Pollack and others on the ignition of metals in acid solutions, and, in respect to zinc, the additional singularity of the smell produced by it when used as an electrode in obtaining an oxide. As to the opinion concerning the gases, he arrives at it from ozone (which he considers to be a compound of oxygen and the electric fluid) being obtained from them. [Ozone, P. C. S.]

One other point remains to be noticed, namely, the connection of the electric fluid with the action. Concerning this our author says,—"Pyrogen enters into the composition of carbonic acid, which may be generated by the passage of a current of the former from charcoal (that is, carbon) points. By this means the oxygen of the atmosphere unites with the carbon, which has the greatest possible affinity for it when pyrogen is present in motion." Again, "Carbonic acid can be dissolved by the abstraction of pyrogen from it, by exhibiting to it gum arabic and other substances which have a specific action on it. When carbonate of ammonia is employed in producing an amalgam of the bases of ammonia and mercury, there is a most decided decomposition of this acid and formation of carbonaceous matters.

"Pyrogen also enters into the composition of nitric acid, which is produced on passing sparks or discharges of it through atmospheric air. . . . By analysis, pyrogen may be obtained from nitric acid by using a solution of the latter in the experiments on the ignition of metals in acid solutions. [Ozone, P. C. S.] In a similar manner it may be procured from nitric, phosporific, and many other acids."

These views of this subject may explain many phenomena going on around us, the causes of which have hitherto been inexplicable. Thus, in one of his papers Mr. Lake says that the development of carbonic acid by plants results from the electric fluid, which is in a constant state of circulation, unitive with the carbon of the plants and oxygen of the air. He might have gone farther, and shown, upon his own theory, that plants not only make use of the fluid in this manner, but that they actually produce it from the water with which they are supplied, as is proved by Pouillet's experiments with insulated corn-plants.

The subject being now, we will not enter into further details; but the above is the substance of what has appeared concerning it.


PYROLA [WINTER-GREEK, P. C.]

PYXIDICULA, an obscure genus of fossil Infracrusta.

(Eberghen.)

INDEX TO THE LETTER P.
QUADRATURE. Not thinking of this Supplement, we inserted in the article TRACTION, P. C., the extension given to the approximate arithmetical quadrature by Mr. Rutherford (Phil. Trans., 1841). With this reference, we take the opportunity of saying that we have re-examined the numbers, and find them correctly printed.

Strange as it may seem, this problem of the quadrature of the circle still engages attention: and persons are found to believe that they have attained even the arithmetical quadrature. It has been stated in foreign newspapers within these few years that the British government does offer, and always has offered, a large reward for the solution of this problem. This, we need hardly say, is a complete mistake: the government never at any time offered one farthing for the quadrature of the circle. The only problem for the solution of which any reward was at any time offered, was the practical mode of finding longitude: and even this offer is now retracted; rewards having been, in fact, received by several persons. Should this article fall into the hands of any, at home or abroad, who are working at any mathematical or astronomical difficulty under the impression that our government is pledged to remunerate them in case of success, they may rest assured that their information is incorrect, and that they will find it to be so on inquiry.

QUAKING-GRAIN. [Breeze, P. C. S.]
QUALITY OF ESTATES. [Property, P. C.]
QUANTITY OF ESTATES. [Property, P. C.]
QUARRIES. [Mines, P. C. S.]
QUARTER-SESSIONS. [Sessions, P. C. and P. C. S.]
QUASSIA. [Simarubaaceae, P. C.]

QUEEN CONSORT. [Queen, P. C.]
QUICKSANDS are those masses of loose or moving sand which are formed on many sea-coasts and generally at the mouths of rivers: those of the Nile and Senegal are among the most remarkable for these accumulations. The sands are generally conveyed by the rivers from the interior of the country, and being at first arrested by the waters of the ocean, they become, by the action of the winds and tides, moveable bars, which are very dangerous to shipping. The loose sands on the coasts are, when dry, driven by winds over the land, which they then cover often to a considerable depth, overlying the fertile ground and occasionally entombing whole villages: the coasts of Cornwall in England and of Jutland in Denmark are particularly subject to these encroachments; and it is stated that, in the latter country, there are vast beds of sand so loose as to be incapable of supporting the weight of a man. In Greenland there is a chain of ice-hills between two promontories of moving sand, which is driven by the winds far out to sea.

The sand of Bagshut Heath, which rests on London clay, is in many places, at a few feet below the surface, saturated with water so as to constitute a perfect quicksand and, on the borders of Oman, in Arabia, there was discovered by Baron von Wrede a remarkable quicksand, which is said to be more than 60 feet deep.

QUINQUELOCULINA. [Foraminifera, P. C.]
QUISCALUS, a genus of birds, allied to storks.
[Struthio, P. C.]
QUIT-RENT. [Rent, P. C.]

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R.

RADIATA. [Rated as RADIATED ANIMALS, P. C.]

RADIOL. [From radiolus, little ray, in allusion to the rayed capsules], a genus of plants belonging to the natural order Gramineae, has a stiv of 4 sepals connected below, deeply trifid. There are 4 petals, 4 stamens, 4 capsules, with 8 cells and 8 valves.

R. is the only species of this genus. It is the R. bienes of some botanists, and is a British plant. The stem is from one to two feet high, repeatedly forked, with solitary flowers in the axils as well as at the extremities of the branches. The flowers are small and white; the capsule light brown and slightly depressed; the sepals deeply and acutely 3-cleft, connected below into a tube. The seeds of this very small plant should be sown in a moist situation where the ray seeds would be allowed to scatter themselves.

(Baillie, Manual of British Botany; Don, Gardener's Dictionary.)

RAIA, a genus of cariologic fishes, established by Linnæus, and since subdivided by ichthyologists. The rays differ from the sharks in being horizontally flattened so that their bodies with their broad and flabby pectoral fins resemble large expanded disks. The eyes and spiracles are placed above the mouth, nostrils and bronchial orifices below.

The dorsal fin springs from the tail. The common skate and the ray are familiar examples.

The following are the principal sub-genera into which R. is divided:

Toretipo. Rays with short and rather thick tails, and having the disk of their bodies nearly circular. Their teeth are small and sharp. The torpedos are remarkable for the electrical apparatus with which they are provided; it is seated in the part between the pectorals, head, and branchia. Fishes of this genus are rare in the British seas, but common on the coasts of southern Europe.

R. bartletti is a large species. The head is slender and bears two small dorsal fins towards the extremity, with sometimes an imperfect caudal fin. The disk of the body is rhomboidal; the mouth is armed with slender slightly-set teeth arranged in quincunial order.

Trigonus. The single species of Trigonus has a slender tail armed with a sharp serrated spine by which the fish can inflict severe wounds; hence its popular name. The head is enveloped in the pectorals, and the teeth are slender and arranged as in Raja proper.

Myliobatis. Tail very long, armed and bearing a small dorsal fin; head projecting from between the pectorals, which are separated by the breast of the pectoral fins, giving the creature a very extraordinary and incomplete or mutilated aspect.

The whip-ray belongs to this sub-genus.

Cephalopetera. Tail also armed, and bearing a small dorsal, but the head is curiously truncated, and is placed between two hollows, the breach of the dorsal pectoral fins, giving the creature a very extraordinary and incomplete or mutilated aspect.

The teeth are small and very slender.

RAILWAYS. [Transit, Railways, P. C. S.]

RAIMBACH. ABRAHAM, one of the most distinguished English line engravers, was born in London in 1776; his father was a Swiss by birth, but he settled in England at the early age of twelve, and never afterwards quitted it; his mother was the daughter of an English farmer in Warwickshire.

When an infant, Raimbach escaped from one of those rare but awful accidents which occasionally happen through the negligence of nurses; he fell from the arms of his nurse by an open second-floor window; but his life was saved, partly by the inflection of his long clothes, and partly by his fall being broken by some leads below. The girl from whose arms he fell was seized with such a panic that she rushed out of the house, and was never heard of by any of the Raimbachs afterwards.

Raimbach was educated in Archbishop Tennison's library-school, where he was the fellow-pupil of the late Charles Matthews; he, however, showed an early determination to excel in the arts, and his father apprenticed him in 1789 to J. Hall, the engraver; and J. Heath had both declined to take him. The first work engraved by the young apprentice was the explanatory key to Copley's Death of Chatham in the National Gallery, where the print also is now hanging, framed and glazed, beneath the picture. After his term of apprenticeship was over he entered as a student in the Royal Academy, anxious to qualify himself in every way for his art; he at the same time did what work he could for the book-sellers; but at this period he seems to have been little cultured in earning as much as thirty shillings a week. His first patron was a bookseller of the name of Stockdale. But, by his general attention and assiduity, he was enabled to unite the profession of a miniature painter with that of engraver, and he prospered in a short period so well in both, that he was under the necessity of giving one of them up, and confining himself to the other. According to his own account, he was influenced not a little in his choice by the uniform difficulties he met with in satisfying his sitter with his miniatures. All had opinions of their own about their looks, which it was necessary to attend to; he therefore gave up portrait painting, as he found engraving a much more independent art.

In 1802, through some prints he executed for Smirke and Forster's illustrated edition of the Arabian Nights, he was in such circumstances as enabled him to take advantage of the temporary peace, and he paid a visit to Paris to view the great galaxy of works of art which the victories of Napoleon had collected together in the Louvre. He has himself given a long account of this tour in his autobiography, published by his son. In 1805 he married and established himself in a house of his own in Warren-Street, Fitzroy-Square, in which he lived twenty-five years, and during which time he executed, the house was given to him by his father on his marriage, and his father died in the same year; in 1807 he lost his mother also. In this year he made the acquaintance of Wilkie, and soon became that painter's intimate friend. In 1812 he became Wilkie's engraver, supplying Burnet, who had already engraved some of Wilkie's pictures in an admirable manner. The chief reason of Wilkie's breaking with Smirke was that what was considered the most valuable interest of his in the prints—one-third of the profits. Burnet would not allow more than this, and Wilkie left him for Raimbach, with whom, however, he was contented with the same arrangements; and, indeed, he himself afterwards voluntarily reduced his share to one-fourth of the profits. The first fruit of this partnership was the celebrated print of the 'Village Politicians.' This print however, owing, it appears, to the indifference of print-sellers to anything out of the ordinary way of business, at first went off slowly; but eventually the sale was large and steady, and a proof of which there were 274, has sometimes been sold at auctions for fourteen or even fifteen pounds. Another print was afterwards published in 1816; after which Wilkie and Raimbach made a tour together in the Netherlands. The rest appeared in the following order: 'The Cat Finger,' 'The Errand-Boy,' 'The Blindman's Buff,' 'The London-Scot,' 'The Beggar,' 'Beadle,' and, in 1836, 'The Spanish Mother and Child.' The last prints, compared with the 'The Village Politicians' and 'The Rent-Day,' were very unsuccessful speculations, and Raimbach thus accounts for the fact in his autobiography:

For the long term of more than twenty years the prints from Wilkie's pictures had enjoyed an almost unprecedented popularity; and it can scarcely be held as a matter of reproach to the public if, after so long a period of favour in one direction, the desire of some sort of change of object should be entertained. The great talents of Edwin Landseer had been already well appreciated, when his picture of the Monks of Bolton Abbey appeared, and placed his reputation on a still higher elevation. Seconded by Cousin's admirable mezzotinto from it, there followed a rush in the track thus so suspiciously commenced, and the new lights (as in Aladdin's lamp) were preferred to the old. Raimbach never employed an assistant, but executed the whole of the plate himself. 'The Rent-Day' cost him two years and a half of incessant labour. His prints are very masterly works, and possess every quality but colour. He died at Wallsend in 1827, 28, in very easy circumstances. His autobiography was published by his son in the same year, under the following title:

Memoirs and Recollections of the late Abraham Raimbach; including a Memoir of his Son, David Wilkie Raimbach.

RAE, JEAN-PHILIPPE, a very celebrated musician, equally distinguished by his compositions and by his
numerous writings on the science, was born at Dijon, in 1638. It may be presumed that he inherited a taste for music, for his father was so passionately fond of the art that after he had been five years in the profession, and obtained the organist’s chair in the Sainte-Croix of the above-named city. He taught his children to play from notes before they could read from letters, and the success they made as organists, so far as relates to musical education, is manifested in the instance of his eldest son, the subject of the present notice, who when only seven years of age was thought an able performer on the harpsichord. He pursued the usual studies of Latin and Greek, which he acquired without reluctance and readily; but an invincible desire, or instinct, as his biographer calls it, led him to music, to which he at length wholly devoted himself. At eighteen he was organist at the church of St. Etienne-du-Mont in Paris. In order to continue the art to which his future life was to be dedicated, but proceeded no farther than Milan, where he became acquainted with a professor with whom he returned to France, and together they visited several of the principal cities, exercising their talents at each with pecuniary views. Soon, however, tired of a wandering life, that allowed him no opportunity for indulging in those speculative inquiries to which he was prone, he went to Paris, and there added largely to his stock of information. Afterwards he became organist of the cathedral of Clermont, in Auvergne, and continued long in that city, in which he wrote *L’Oiseau de l’Harmonie*, but not finding the readers for printing a large quantity of his compositions, he proceeded to the capital of France, where in 1722 he published his great work, and finally fixed himself. He was elected professor of the college of Saint Croix de la Bretorniere, and employed his spare time in copying ancient theoretical treatises, in composing his harpsichord lessons, and in teaching. He did not distinguish himself in that line in which he was desirous to excel till the year 1730, when, at fifty years of age, he produced the opera of *Hippolyte et Aricie*, the drama by the Abbé Pellegrin. The success of this provoked much professional envy, if not national discord, and a feud was raised among the admirers of Lully [LOUL, P.C.] and Rameau, similar to that which in after times was carried to greater excess by the Gluckists and Piccinnists. [GLUCK, P.C.; PICCI, P.C.] The Prince de Conti asked Campra, the celebrated Maître de Musique of Notre-Dame, what he thought of the new work? He replied, ‘There is enough of music in it to make six operas.’ Till the production of *Hippolyte*, Voltaire alone had discovered Rameau’s genius for composition. He previously gave him his tragedy of ‘Samson’ to set, and discerned the beauty of its music; but its performance was prohibited under the pretext that it prostituted a sacred subject. Of the many operas by Rameau, his ‘Castor et Pollux,’ published in 1733, and his ‘Médée’ in 1737, is the best: it was represented one hundred times. There are parts of it that must always excite the admiration of true connoisseurs. A chorus in this, of Spartans, ‘Qui tout germesse,’ has been set to music by many modern masters. Even M. Ginguéni, who estimates his countryman at a low rate, admits the merit of this composition. His ‘Dardanus,’ his ‘Zoroaster,’ and other pieces, were equally successful. From 1724 to 1769, he was Maître de Musique of the King’s Palace, and besides harpsichord and other compositions; together with many theoretical and controversial works. His merit, long contested by envious rivals, was at length generally acknowledged. The king created him for the office of cabinet composer. Afterwards he granted him letters of nobility, and named him ‘Chevalier de Saint-Michel.’ The Academy of Dijon had previously received him among their members, and the French Senate, in recognition of his fame, exonerated him from the impurity, from the tax called ‘La Taille.’ He died in 1764, leaving a son and a daughter, and was interred with every mark of respect and distinction.

Rameau’s style of writing is not remarkable for perspicacity. This was felt and acknowledged by his most zealous partizan, D’Alember, with sufficient justice. It is ‘superficial and prate- 

tique, suivant les Principes de M. Rameau,’ has endeavoured
to clear the work from the obscurity in which it undeniably
is involved; but the great French geometer has only par-
tially succeeded. He has been assisted in this task by the
early edition of the ‘Encyclopedia Britannica’ adopted
D’Alembert’s work. In later editions the article has been
omitted, and a much better one substituted. (Biographia Universelle; De Laborde, tome iii.; Burney, vol. iv.)

RAMENGUI, BARTOLOMEO, called IL BAGNACA-

VALLO, from the place of his birth, Bagacavallo, on the road

from Romagna to Bologna, is, in his capacity as a pupil of Raphael, as one of his principal assistants in the Vatican; and after the death of his great master he carried the principles of his style to Bologna, and assisted to enlarge the reputation of that school. Raphael was his model and test of excellence, and he did not attempt to look beyond him, presuming that little was to be acquired by ordinary abilities from nature compared with what the works of Raphael afforded for imitation. Though possessing less vigour than Giulio Romano or Perino del Vaga, Bagacavallo acquired more of the peculiar grace of Raphael’s style, especially in his infants, and his works were much studied by the greatest masters of the fifteenth and sixteenth centuries. His works by Bagacavallo in San Michele in Bocco, San Martino, Santa Maria Maggiore, and Santi Agostino agli Sco- pettini, in Bologna. He died at Bologna in 1542, according to an incorrect document of his biographer Thevet, but it was Bagacavallo, who assisted Vasari in Rome, and Primitracio at Fontainebella, was the son of Bartolommeo Ramenghi.

(Brunfeldi, Le Vite di’ più insigni Pittori e Scultori, Venice, 1624; this report was based on a MS. in MS., but it has been recently (1846) published for the first time at Ferrara by Domenico Taddei, after lying in MS. for nearly a century. Lanzi, Storia dell’Arte, &c.)

RAMMOHUN ROY. Rajah, born about 1774, in the district of Burdwan, in Bengali, Hindostan. His paternal ancestors were Brahmins of a high order, and were devoted to the religious duties of their race, till about the beginning of the seventeenth century, when they gave up spiritual exercises for worldly pursuits. His maternal ancestors, also of high Brahminical rank, and priests by profession as well as by birth, uniformly adhered to a life of religious observances. Rammohun Roy was taught Persian under his father’s roof, was sent to Patna to be instructed in Arabic, and afterwards, at the request of his maternal relations, went to Benares, in order to be initiated into the Vedas. He was initiated into the Vedas in 1787, is it the best: it was represented one hundred times. There are parts of it that must always excite the admiration of true connoisseurs. A chorus in this, of Spartans, ‘Qui tout germesse,’ has been set to music by many modern masters. Even M. Ginguéni, who estimates his countryman at a low rate, admits the merit of this composition. His ‘Dardanus,’ his ‘Zoroaster,’ and other pieces, were equally successful. From 1724 to 1769, he was Maître de Musique of the King’s Palace, and besides harpsichord and other compositions; together with many theoretical and controversial works. His merit, long contested by envious rivals, was at length generally acknowledged. The king created him for the office of cabinet composer. Afterwards he granted him letters of nobility, and named him ‘Chevalier de Saint-Michel.’ The Academy of Dijon had previously received him among their members, and the French Senate, in recognition of his fame, exonerated him from the impurity, from the tax called ‘La Taille.’ He died in 1764, leaving a son and a daughter, and was interred with every mark of respect and distinction.

Rammohun Roy was a Brahmin by birth, and was trained by his father in the doctrines and observances of his sect; but his opinions seem to have become heretical at an early age. He became a disciple of Hylas Kim, a Dr. Stump of the Serampore mission, and visited South India in 1790. In this he was inspired by a scripture calling in question the validity of the idolatrous system of the Hindos. This, together with my known sentiments on that subject, having produced a coolness between me and my immediate hind, I removed, in my travels, and from county to county, through different countries, chiefly within, but some beyond, the bounds of Hindostan. When I had reached the age of twenty my father recalled me, and restored me to his favour.’ Afterwards he says, ‘My continued controversies with the Brahmins on the subject of their idolatry and superstition, and my interference with their custom of burning widows, and other pernicous practices, revived and increased their animosity against me, and they engaged my father to expel me from his family, and go into India. My father was again obliged to withdraw his countenance openly, though his limited pecuniary support was still continued to me.’ His father died in 1803, and he then published various books and pamphlets against the Brahmins, in the native and foreign languages. ‘The ground which I took in all my controversies was, not that of opposition to Brahminism, but to a perversion of it; and I endeavoured to show that the whole system is built against the interests of their ancestors, and to the principles of the ancient books and authorities which they profess to revere and obey.’ In order to deprive him of caste, the Brahmins commenced a persecution against him, which, after many years of litigation, was decided in his favour.

Of the body of Hindu theology comprised in the Vedas [VEDA, P.C.]; there is an abstract called the ‘Vedant, or the Resolution of the Veda,’ written in Sanscritic
Rammohun Roy translated it into Bengalee and Hindustanee; and afterwards published it in an abridgment in the 'Circaut.' This publication was entitled "The Precepts of Jesus the Guide to Peace and Happiness." In this section he omit the miracles and doctrinal parts, and confines himself to the simple religious and moral precepts. In 1830 he was engaged by the King of Delhi to make a representation of grievances to the British government, for which purpose the King conferred on him the title of Raaj, and appointed him ambassador to the British court. He arrived in London in April, 1831. The British ministers recognised his embassy and treated him with every mark of respect and hospitality. He returned to India on September 27, 1833. He was buried in a shrunken bar of Stapleton Grove, without a pall over the coffin and in silence. The Christian observers were carefully avoided at his own request, lest it should be made an occasion against him by the Brahman caste and, by causing him to lose caste, deprive his children of their inheritance. His funeral was attended by his youngest son born to him, who had come to England with him. Two other sons survived him in India.

Rammohun Roy was acquainted more or less with ten languages—Sanskrit, Arabic, Persian, Hindustanee, Bengalee, English, French, Hebrew, Latin, and Greek. Sanskrit and Arabic he knew critically, and as a scholar; Persian, Hindustanee, Bengalee, and English, he spoke and wrote fluently. Of the other languages his knowledge was less perfect. In person he was tall and somewhat unwieldy; his features were handsome, his complexion dark, and the general expression of his face was very pleasing. He associated a good deal with the Unitarians in this country, and frequently attended their meetings. He added to the helms of the Unitarians in Christ, and seems to have considered the acceptance of the doctrines of Christ to be quite consistent with a belief in the Brahmanical religion as it is in the ancient Sanscrit authorities. He was the author of "On the origins of the Labour, Opinions, and Character of Rammohun Roy," by Last Carpenter, LL.D.

Rampart, probably from Riga, an embargo, from which is derived the Italian word "Riparo," and the French word "Rempart," is, in modern fortification, a mass of earth often nearly 80 feet thick, surrounding a town or a military position, or constituting the face of an outwork; and its use is to protect the interior of the town from work or work or against any sudden enterprise of the enemy, as well as to give the defenders a superiority of elevation with respect to the works of the besiegers.

The ramparts of ancient fortresses were walls of stone or brick, frequently from 80 to 100 feet high and 30 feet broad, including the galleries made in them; round or angular towers were formed at intervals along the wall; and, by means of the galleries, the defenders could pass within the thickness of the wall from each tower to the next. The rampart was surmounted by a parapet seven feet high and two feet thick, which was provided with casks and water and had a transverse parapet. It was in order that the exterior foot of the high wall might be defended, machicolations were formed at the top, particularly over the entrances. [Bartros, P. C.] A great mass of earth was raised against the wall nearly as high as the top, places where elevated ground or the enemy's works on the exterior allowed access to the top of the wall to be gained in force; and on this mass the cohorts were drawn up in order of battle. (Vitruvius, lib. i., cap. 1.)

The modern rampart is surmounted by a parapet of earth, on the interior side of which, towards the town, is a nearly level space, varying in breadth from 35 to 40 feet, called the terreplein of the rampart; on this terreplein the garrison was placed: and in the rear of the guns there is room for the movements of the defenders and the conveyance of the ammunition. The exterior and interior sides of the rampart are formed with slopes in making angles of not more than forty-five degrees with the horizon: or they are retained by revetments, or walls of brick or stone, nearly up right, the exterior face of the rampart constituting the escarp of the ditch in front. The rampart is generally placed at a greater distance from the walls than the escarp, and was lengthened, in parts making salient or re-entering angles with one another; and these parts constitute the faces and flanks of the bastions, and the curtains which connect the latter together. Not more than 80 feet are allowed for the breadth of the terrepleins of the ramparts of outworks, measured from the foot of the parapets, in order that the enemy may not be able to form batteries for artillery upon these terrepleins. The terrepleins of all ramparts should have a small slope down, towards the interior, in order that the rain-water may not lodge on them, and that the defenders near the interior edge of the rampart may be effectually covered by the parapet. The interior slope of the terreplein in the front is generally covered with turf. A rampart whose exterior side is of earth, or without a revetment of brick or stone, might be easily ascended by an enemy at the time of an attack, and might be penetrated in that case, would be planted in it for the purpose of impeding the progress of the enemy, might be easily destroyed by artillery, so that the place would be liable to be carried by a sudden assault.

The relief, or height, of a rampart is regulated by the occasional necessity of employing a fire of artillery from the rampart, and, at the same time, a fire of musketry made over the glacis by men posted in the covered way beyond the ditch in front of the rampart: for this purpose a line of fire from the rampart should pass three or four feet above the crest of the glacis in its front, in order that the wind of the shot may not injure the defenders. The relief of a rampart with its parapet may, therefore, be thus determined:—On a drawing representing a vertical section of the works let a line be drawn from the foot of the glacis, through a point taken at 3 or 4 feet above the crest of that work, and let it be produced till it cuts the interior slope of the parapet on the rampart: this intersection will give a point in the axis of a gun placed on the rampart, or a point a few inches above the sole of the embrasure, that is, about 33 feet above the terreplein of the parapart; and, because the artillery are to be protected by the parapet, if 74 feet be the height of the embrasures of the glacis, 51 feet will be the height of the glacis, and 23 feet will be the height of the ground, the sum will be the required height of the crest of the parapet.

Rampur, a town of Hindustan, in the district of Bareilly, province of Oudh, India, on the boundary of the laws of the east bank of the Cisira river, in 28° 48' N. lat., and 79° E. long., 106 miles E. by N. from Delhi, direct distance. The town, at the time of the death of Fynola Khan, a Rohilla chief to whom it had been secured by the peace of Lalding in 1774, was four miles in circumference, and the centre of a flourishing district, but has since been greatly reduced. The district was granted to the nawab of Oudh on the termination of the Rohilla war, and the town was ceded to the British in 1801, by whom it was transferred to the nawab of Rampur, together with a small territory.

Rampur is chiefly remarkable for the curious fortification by which it is surrounded, a high and thick kind of bamboo faced on the outside by a prickly underwood of cactus and babool. The entrances are by narrow passages, defended by strong wooden barriers. It is said to be extremely effectual in resistance against irregular troops, since neither cavalry nor infantry can be brought to act against an enemy whom they cannot see, and who is flying from them among the close shrubs, and can be covered only by the almost impenetrable cover on the outside. (Hamilton's East India Gazetteer; Heber's Narrative of a Journey through the Upper Provinces of India in 1834 and 1835.)

Ramsay, Andrew Michael, generally known as the Chevalier Ramsey, was born at Ayr, in Scotland, the year 1868. He was educated at Edinburgh, where
chiefly devoted himself to the study of mathematics and theology; the distinction he obtained as a scholar procured for him the appointment of tutor to the son of the Earl of Wemys, at the University of St. Andrew's. Having entered into a religious controversy, the fruits of which were an increase of his doubts and even an inclination to general scepticism on the great doctrines of the Christian religion. In this state of mind he determined on having recourse to Fénélon, who was at that time residing in his diocese of Cambrai. Ramsay was but twenty years of age when he formed the acquaintance of the Archbishop of Cambrai, but his mind had already been sufficiently trained by study and meditation to enable him to appreciate the talents and to recognize the virtues of that eminent divine. Towards him Fénélon exercised his instructive talent as a moral teacher, and in short time made him a convert to the Roman faith. He soon became the disciple of Fénélon, not only in religious matters, but also in his literary taste and opinions. His writings were formed on the style and after the manner of his great master, whose phrases and precepts were very satisfactorily acknowledged. Ramsay readily acquired so perfect a knowledge of the French language as to become an excellent writer. Some of his earlier productions were the means of obtaining for him an appointment as tutor to the Duke of Château Thierry and afterwards to the Prince of Turenne; he was also created a knight of the order of St. Lazarus. His reputation induced the Pretender, in 1724, to invite him to Rome, and to employ him in the education of his son. He remained there however only a year in that city, and left it in disgust with the petty intrigues which he found to form the principal occupation of the miniature court of the son of the exiled king. The next year he revisited Scotland, where he remained a considerable time, which he employed in literary labours. On leaving England, he obtained, through the influence of Dr. King, the degree of doctor of civil law in the University of Leyden, and he was also admitted a member of the Royal Society of London. After his return to France he was appointed intendant to the house of Turenne, who afterwards became Duke of Bouillon; he held this situation till his death, which took place at St. Germain-en-Laye in the year 1743.

The writings of the Chevalier Ramsay are more remarkable for the purity of their style and the perfect knowledge which they manifest of the French language, than for their depth or originality of thought. As a theologian he was visionary in the extreme, and his orthodoxy, even according to the niceties of the church he had professed, was often considered as a surprise. It is fortunate for his religious reputation that he did not live to publish some philosophical works which he was preparing, such as his answer to Spinoza, and a treatise on Human Understanding, ' in which he says Spence, 'there were several notions that would have made him be looked upon as a heretic in our church, as well as in his own.' (Spence's Anecdotes, p. 84.) The work of the same author, on the ' History of Cyrus,' is in imitation of the Telemachus of Fénélon, but, according to Voltaire, a very feeble one. The character of Zerina gave considerable offence to the Princess of Conti, one of the most learned ladies of the age, who imagined that she was portrayed in it. There is an excellent translation of that work, by Hooke, though said to have been accomplished in the short space of twenty days [Hooke, Nathaniel, F. C.]; it is far a long time afterwards mistaken for an attack on the belief respecting it being that Ramsay had written the Voyages of Cyrus in English as well as in French. The best edition of the French is that of 'Paris et Londres,' 1727, 2 vols. 8vo. The work, however, for which posterity is most indebted to him is that entitled 'L'Histoire de la Vie de François de Saligan de la Motte Turenne.' Hague, 1728; published also in London the same year. His great intimacy with the Prince has been accounted for by his personal acquaintance with the facts of his private life, and it contains a valuable record of his opinions. His other published writings are 1°, 'Discours sur la Méthode,' originally prefixed by the Prince of Condé in 1728, 8vo. 'Théorie Philosophique sur le Gouvernement Civil.' London, 1721; it was afterwards reprinted under the title 'Essai de Politique.' 2°. 'Histoire de Turenne.' Paris, 1725, 3 vols. 8vo. and 4 vols. 12mo. With some affectation in the style and a redundancy of reflection this history possesses much merit from the precision of its facts and the lively portraiture of its characters. 4°. 'Le Psychomètre, ou Réflexions sur les différents Caractères de l'Esprit, par un Mylord Anglais.' 6°. A posthumous work published in 1760, entitled 'Philosophical Principles of Natural and Revealed Religion explained and unfolded in a Geometrical Order.' (Dictionnaire Historique, vol. 4, Amsterdam, 1788; Dictionnaire Historique Critique, Paris, 1799; Speck's Dictionaries of Books and Men, London, 1800. The details of his conversion to the Roman Church will be found in the life of Fénélon by le Fère Quereubeuf, appended to his edition of his works, Paris, 1721.)

Ramsay, Allan, an eminent portrait painter in his time, and the son of Allan Ramsay the poet, was born in 1718, in Edinburgh, the birth-place of his father also; the ceremony was performed by Churchill, in his satire of the 'Prophecy of Fame':—

'Then came the Ramsays, men of worthy note,
Of whom the world could tell, as the other gods.'

'\"Ramsay\", says Edwards, \"may be called self-taught; but he studied a short time in Italy with Solimena, and F. Fernand, called Imperiali. After practising a short time in Edinburgh, he settled in London, where he was introduced by Lord Bute to George III. when Prince of Wales. He painted two portraits of the Prince, which were engraved, one by Ryland, and the other by Wootlett. At the death of his master Mr. Shepherd, King of Prussia engaged him to paint the king; he retained the place until his death, when he was succeeded by Sir Joshua Reynolds. He died at Dover in 1764, on his return from a fourth visit to Rome; he had painted the portrait of Pope Clement XIII. Edwards says that Ramsay was not an excellent portrait painter, was superior to the generality of the painters of his time; he was Walpole's contemporary, and is noticed in somewhat flattering terms by that universal critic, considering with whom he is coupled: he says, 'Ramsay and Reynolds and Ramsay have wanted subjects, not genius.' Edwards says that Ramsay was not devoted to his art; he allowed literature to divide much of his time with it. He was also a judge of French, and Italian; and, in his latter days, like the elder Cato, acquired some knowledge of Greek. He was the author of some political papers. He was twice married; his last wife was a daughter of Sir David Lindsay. His son and daughter survived him; the son became a general in the British army, the daughter was married to Sir Archibald Campbell.'

(Edwards, Anecdotes of Painters; Cunningham, Lives of the British Painters, etc.)

Randin (named after Isaac Rand, M.D., once a demonstrator of botany at the Chelsea botanic gardens), a genus of plants of the Gentian family, is of a brownish color, and is noted for its annual flowering. R. dunatorum, Bush-Randia, is a thorny branching small shrub or tree, with oval leaves, rather blunt, cuneate at the base and smooth. The flowers are very sweet-scented, sessile, solitary, yellow, nodding, not in clusters, like the villosa. The fruit is smooth, yellow, resembling a small crab-apple, firm and fleshy. The seeds are oval, numerous, and lying in mucus. The fruit when bruised and thrown on the floor, is covered with a mucus, like the Coccus Indicus, which is not, however, known in the East Indies, where this plant grows. In the form of powder it is powerful a emetic. An infusion of the bark of the root is employed to nauseate in bowel complaints. R. wilkinson, Bog-Randia, has almost terminal opposite thorns, tetragonal branches, oblong leaves somewhat cuneate, glabrous; the flowers solitary, sessile, almost terminal. It is a native of the Lower Llobregat, the grooved root is much more like the villosa than the villosa. The fruit is large, white, and fragrant, and in two or threes at the top of the branchlets. The berry is about the size of a pullet's egg, blue-green, and peckled. The seeds are fattish, nearly globular, in the pulp. The flowers of this species render it deserving of a conspicuous place in the hothouse.

The uncommon appearance of this plant is also in its favour. There are 88 species of Randia, none of which, however, are applied to medicinal purposes. They are good for the Asiatic flowers. The soil best suited for them is a mixture of loam, peat, and sand. The flower stave thrive best in a moist heat; they do not flourish readily if kept up in a dry hot heat under a glass. They are very showy, usually bearing large white fragrant flowers, and are worth cultivating in every collection of semi-tropical plants.
RAN COUNCLE, a noble family of Modena, which became illustrious in the middle ages, not only for the part which it took in the political and military vicissitudes of Italy, but more particularly for the patronage which it gave to learning and to the arts. Count Nicolò Rancone, who lived in the latter part of the fifteenth and first part of the sixteenth century, had two daughters, whom he caused to be instructed with great care, and all of whom became distinguished for their love of science and learning. The eldest, Laura, was the preceptor to several of them, has left an interesting memorial of the care bestowed on their education in his Dialogues entitled  'Antonio Maria Visdomini de Oculo et Sybillis.' One of his grandsons, Count Cesare Rancone, was a distinguished general in the Venetian service, and afterwards in the service of King Francis I. Filofo, in his book 'De Optima Hominum Felicitate,' which he addressed to Count Guido, enumerates the acts he had performed in his military career, and praises him likewise for the liberal encouragement which he afforded to the learned. Bernardo Tasso, father of the great poet, was for a long time secretary to Count Guido. Guido died at Venice in 1537. His brother, Cardinal Enrico Rancone, who died young during the pagille of Rome in 1527, is likewise extolled for his love of learning by Guglielmo Giraldi, and also by Vida in his second book 'De Arte Poetica.' Mr. Curtis says that the cardinal used to take his meals with his dog, and to peruse, while dining, a large book; and to look for his second husband Cesare Fregoso, a well-known Genoese emigrant in the service of Francis I., who was murdered in 1541 by the emissaries of the Marquis of Vasto, Governor of Modena and Pesaro, Countess Camilla, who was betrothed at the age of twelve to Bandello, the celebrated novelist, who wrote many of his tales for her entertainment. Ginella Rancone, sister of Costanza, married first a nobleman of the Correggio family, and in consequence of her nobility and intelligence, was well known in Ferrara. The character of her sister, Balbo, has been praised by Scaliger for her intellectual accomplishments. Her nephew, Count Fulvio Rancone, a pupil of Carlo Sigonio, was employed by Alfonso II. of Este in a diplomatic capacity, and his sister Claudia fixed her residence at Rome, where she enjoyed considerable interest at the papal court, and was even consulted on matters of state. The love of learning and the patronage of the family and house appears to have been hereditary in the family of Rancone. The Marquis Gherardo Rancone founded in 1783 a Scientific Academy in his palace at Modena, which awarded prizes for physiological and other studies and discoveries.

(Litta, Famiglia celebri Italiani; Tiraboschi, Storia della Letteratura Italiana; Memorie intorno alla Vita del Marchese Gherardo Rancone, Modena, 1818.)

RANUNCULUS (from ranus, a frog, because many of the species inhabit humid places frequented by that reptile), a genus of plants, the type of the natural order Ranunculaceae. It has 5 sepals, occasionally 10, with a nectariferous excretory sac at the base of the receptacle. The calyx is generally tubular, the achenia ovate, somewhat compressed, mucronate, arranged on globose or cylindrical receptacles. The species are mostly acrid, and if applied when fresh to the skin will produce blisters: this quality is destroyed by drying or by heat.

R. aquatilis, Water-Crowfoot, has a floating stem and submerged leaves divided into numerous capillary segments spreading on all sides. The floating leaves are remiform, from 3- to 6-parted, the lobes wedge-shaped, toothed at the top, the petals obovate, larger than the calyx, the flowers white or yellow. It is native throughout Europe, Western Asia, North Africa, and also in America and England, in pools and stagnant waters. It is the Baragew tatravov of Dioscorides, 2, 206. Sometimes it produces very large flowers, and grows 3-4 feet high and it has a curious and valuable variety in the floating and immersed leaves adds greatly to its beauty. Dr. Pulteney contradicts the assertion of its deleterious qualities, and says that it is not merely harmless but nutritive to cattle, and tells us that on the borders of the Avon the cottagers support their cows and horses almost wholly on this plant. Hogs are also fed upon this plant, and appear to thrive on it, so that it seems we cannot class this species with others of the same genus as having poisonous qualities.

R. flammula, Flame-Crowfoot, is a smooth plant with a rooting decumbent stem, branched, leafy and hollow, sometimes hairy. It is common in all parts of the country, with half-sheathing stalks, alternate, usually ovate, lanceolate, but varying much in breadth, often serrated. The flowers are terminal, opposite the leaves, and of a bright yellow colour. The leaves are vestigial. Dr. Withering recommends the distilled water as an instantaneous remedy in cases of poison.

Lightfoot says the bruised leaves are used to raise blisters in the Isle of Skye and the Highlands of Scotland. It is native of Europe, Asia, North America, and Great Britain.

R. glacialis has stalked radical leaves, palmated and trifid, the lobes blunt, the flowers generally one-flowered; the calyx very hairy, the carpels compressed and sharp-edged; the petals white. It is native of the higher Alps of Europe and the Rocky Mountains of North America, the mountains of Dauphiny call this 'Carville' or 'Carrilline,' and employ an infusion of it in hot water as a powerful sudorific in colds and rheumatism.

R. acris, Buttercup, has a fibrous root, the stem about two feet high, erect, round, hollow, leafy, clothed with close-pressed hairs, branched above and many flowers. The radical leaves are on long upright footstalks, in 3 or 5 deep lobes, the stem-leaves are nearly sessile, with fewer and narrower segments, the uppermost most smaller in 2 linear entire lobes, or sometimes simple and linear. The flowers are of a bright yellow, on round even stalks covered with close hairs and not furrowed. The calyx is hairy, spreading, and deciduous; the carpels smooth, lenticular, with a slightly curved point. This species is extremely acrid and dangerous. Lightfoot says that bruising up and applying it to some little distance has produced inflammation in the hand. Cattle in general will not eat it, but sometimes when they have been turned hungry into a field they have fed upon it, and for Ciba has been used as a cure for corns.

According to Linnæus sheep and goats eat it, but cows, horses, and swine refuse it. When made into hay however, its noxious qualities are lost. It is commonly called buttercup, under which name it is found in all the herbals, and is owing to these plants. A double variety of this species is cultivated in gardens under the name of 'Bachelor's Button.'

R. sceleratus, Celandine-Crowfoot, has a fibrous root, the radical leaves with 3 stalked trifid and cut leaflets, furrowed peduncles and reflexed calyx, the heads of the fruit oblong, the carpels minute and with a single seed. The flowers are very small and pale yellow, numerous, on solitary stalks, either terminal, axillary, or opposite the leaves. The bruised leaves raise blisters on the skin, which are not soon healed, and are said to be used by impostors to cause ulcers on their bodies, and thus excite compassion. It is one of the most virulent poisons of our native plants. The distilled water of this species is highly acrimonious, and when cold deposits crystals which are scarcely soluble, and a great effusion of tears,

The delterious qualities are, however, dispelled in decoction, and accordingly the shepherds of Wallachia boil it and eat it.

R. Thora has an exceedingly acrid and poisonous root, and is native of the Alps of East France. It is formerly used by the Swiss hunters to poison their darts; wounds so produced speedily become fatal.

R. flaxius, Filowetor, has a root with fasciculated tubers, coriaceous stalks and leafy, or corymbose, or corymbose, or corymbous, or corymbous-flowered stem, usually three sepals, and smooth blunt carpels. The flowers are golden yellow, and it is native throughout the whole of Europe in meadows, bushy places, and about hedges, and it is fruitful in Britain. The young leaves of this plant, according to Linnæus, are used as greens in Sweden. A notion that the root is efficacious in the cure of piles it gives its common English name. We usually find the flower closed from five to nine in the evening, and in wet weather. It is the χελιδόνιον of Theophrastus, Hist. Plant. 7, 14, and the χελιδόνιον μερος of Dioscorides, 2, 212, and of Pliny, Hist. Nat. 24, 195.

R. arvenis, Corn Crowfoot, has a fibrous root, the radical leaves 3-leafed, dentate, the stem-leaves once or twice ternate, with linear lanceolate segments, the calyx erect-patent, the carpels marginated, beaked, and spinous; the flowers are pale yellow. It is native throughout Europe, in North America and Great Britain. It is very acrid and dangerous to cattle, though they are said to eat it greedily.

M. Brunton, who has given a particular account of its qualities, relates that three ounces of the juice killed a dog in four minutes. Several sheep were killed by eating this herb at Turpin, which first led to an investigation of the matter.

R. bulbosum, one of the commonest and most extreme acrid, and raises blisters and produces extensive inflammation of the skin. Gilibert states that it vesicles with less pain than cantharides and without affecting the urinary passages.

R. ranunculus, common Garden Ranunculus, has a terminal or
ritenate leaves, the segments toothed or deeply trifid, the stem erect, simple, or branched at the base, the calyx spreading, afterwards reflexed, the spires of the carpels cylindrical, the style shorter than the calyx. The flowers of the latter species are yellow or blue. The flowers of this variety are generally formed double, and have all colours except blue. It is called the Persian Ranunculus. 2. R. a. languidus, with a simple stem, ternate leaves, the segments leafless or with a small point, the flowers being yellow, orange, or yellow. This is called the Turkey Ranunculus. 3. R. a. hirundinarius, with a somewhat branched stem, and multifid leaves with linear acute lobes. It is a native of the island of Cyprus, and has white or yellow or purple flowers.

The Garden Ranunculus is a florist's plant, and has been cultivated with great care. The garden varieties of this species are very numerous, as no two plants produce flowers precisely alike. Madder, who wrote on these plants, had a collection of 800 varieties, all with proper names. In judging of a Ranunculus the following qualities are desirable:—The flowers should be of a hemispherical form, at least two inches in diameter, consisting of numerous petals, gradually diminishing in size to the centre, lying over each other, so as neither to be too close nor too much separated, but having more of a perpendicular than a horizontal direction, in order to display the effect. The flowers are with entire rounded edges, their colours dark, clear, rich, or brilliant, either of one colour or variously diversified on an ash, white, or yellow ground. The flower buds are often spotted or mottled in an elegant manner. (Georg. Del.) In cultivation this plant prefers a rich loamy soil, which should be well manured, and it is customary when forming beds for it to place a layer of well-rotted cow-dung seven or eight inches below the surface. They are usually propagated by dividing the roots, which may either be planted in November or March. The former is the best time, but the roots should then be mulched. In order to obtain varieties, seeds should be obtained from the single or semidouble plants, and planted in August. The following year, when their leaves drop off, the roots should be taken up and dried in the same manner as the old roots, and planted with them in November.

The R. languidus Linnæus is the barbatus Linnæus (Schoenoprasum of Dioscorides, loc. cit. The R. mucronatus, Linnæus is the barbatus Linnæus of Dioscorides, loc. cit. (Don, Gardener's Dictionary; Lindley, Flora Medicæ; Fränz, Synopsis Flora Classica Plantarum; Burnett, Outlines of Botany.)

RAPHIOSAURUS, a genus of fossil Reptiles from the lower Cretaceous of the Cretaceous system (Owen.)

RAPE. [Rape, P. C.; Law, Criminal, P. C. S.]

RASK, RAMUS CHRISTIAN, one of the most distinguished linguists of modern times, was born on the 2nd of May 1787, at Nyborg in the province of Fyen, or Funen, in the kingdom of Denmark. His parents were poor people, but the boy's talents and inclinations procured him friends who afforded him the means of procuring his education at the university of Copenhagen. He afterwards spent some time in Iceland, and also made journeys to Sweden, Finland, and Russia for the purpose of increasing his knowledge of languages, for which he had a very extraordinary talent. In 1808 he obtained a situation connected with the university library at Copenhagen, and he availed himself of the opportunity by making himself acquainted with the most ancient documents of Danish history and literature. His knowledge of languages led him to devote himself to comparative philology, to search after the connecting links and trace them to their common origin; and in order to complete this branch of study, he undertook in 1817, with the support of the Danish government, a journey to Russia, whence he proceeded in 1819 to Persia. He made some stay at Teheran, Persepolis, and Shiras, and in 1820 went to India, from whence he returned in 1822 to his native country. In this expedition he had purchased for the Copenhagen library 118 ancient and rare oriental manuscripts, among those in the Pali language were the most valuable. Rask was invited to the university of Edinburgh, but as he declined the offer, he was appointed professor of the history of literature in the university of Copenhagen. The king had promised him his support, if Rask remained in Denmark, but for some time he neglected them, and devoted his time to an analysis of the Danish language. In 1827, however, he returned to his oriental pursuits, and wrote on Egyptian and Hebrew chronology, and on the age and authenticity of the Zend a Vesta. In the meantime he had commenced the publication of the Danish Academy, the Society of literature, and of the society for the investigation of northern antiquities, and he took an active part in the management and editorship of the journals of these societies. At the same time he performed important work on the Sami, the Iceland, and the Norwegian languages, and wrote two dictionaries of the Scandinavian, including also the eastern languages, but his edition of Lokman's Fables, Copenhagen, 1832, shows that his knowledge of Arabic was very deficient; and it may be said in general that, as far as the oriental languages are concerned, he had more skill in general comparisons and investigations of their grammatical structure than an exact knowledge of any particular language. His works show that there was scarcely a language worth studying of which he had not some knowledge: and all the civilized languages of Europe were almost as familiar to him as his own mother-tongue, and his knowledge of the northern languages is univalved. He died at Copenhagen on the 14th of November, 1832, and his numerous MSS. relating to philology were given up by his relatives to the king's library at Copenhagen.

The principal works of Rask are, 1. An Introduction to the study of the Icelandic and ancient Northern Languages, Copenhagen, 1811; 2. An Anglo-Saxon Grammar, Stock-holm, 1817; one of his best works, has been translated into German and Danish. 3. An Introduction to the Investigation concerning the Origin of the ancient Northern or Icelandic Language, Copenhagen, 1814; 4. An edition of Björn Haldorson's Icelandic Ili- cary, Copenhagen, 1814; 5. A Spanish Grammar, Copen- hagen, 1894; 6. A Friian Grammar, Copenhagen, 1851; 7. An attempt to reduce the Orthography of the Danish Language to Principles, Copenhagen, 1826, is a strange work in which Rask attempted to introduce a complete reform in Danish orthography. He did not succeed in his attempt, but the work is full of the most extraordinary linguistic learning; 8. On the age and authenticity of the Zend a Vesta, Copenhagen, 1826, was translated into German by F. H. von der Hagen, Berlin, 1826; 9. A small Grammar and Vocabulary of the Acra Language. In the last year of his life he finished a very complete Grammar of the Language of Lapland. A number of essays on linguistic subjects appeared in various journals, and in Vater's 'Verzeichnisarbeiten,' there is one on 'Die Tharkische Sprachclasse,' which is of great importance and interest. Comparative philology is greatly indebted to Rask, for he was the first who pointed out the connexion between the ancient northern languages of the one hand, and of the Lithuanian, Slavonic, Greek, and Latin on the other hand. (Zeitungen, third series, No. xxxi.) RATIO, COMPOSITION OF the 'Five' or 'Ten' words which are found in the statements in Ratio, P. C., p. 4; and will be worth while to add considerable development. The idea implied in composition of ratio is very imperfectly treated in Euclid; and yet upon the composition of the ancient mind, as we will show, he has been invincible over the difficulties of inconceivable which appeared in the fifth book gives reality or imaginary.

In every matter connected with elementary geometry, confusion may and often does arise from mixing together criticisms of two different kinds; on Euclid as a writer, and on the subject as a matter of thought. To avoid such confusion we begin with the consideration of what we find in Euclid—not in Simon's Euclid, nor Playfair's Euclid—but in Euclid of Alexandria.

There is nothing on ratio compounded (epagogen) of ratios in the fifth book; the word translated composition (epagoge) refers to such a process as the formation of the ratio of A+B to B from that of A to B. But the definitions of, duplicate, triplicate, &c. ratio are laid down; which, as we shall see, are particular cases of the compounded ratio of A to B: and so on.

In one proposition, and in one only, is the phrase composition of ratios used: in the 23rd of the sixth book, where it is stated, 'Euclid has compounded of the sides.' There is no definition at least, it
press it, how-much-fold is used instead of how-many-fold, that much may suggest the idea of part of a time (commissurable or not) where many would only suggest that of an integer. We cannot much admire this refinement; nor does it give any help: for the introduction of the idea of incommensurability numerical names is ceased, as so to be fit for arithmetical multiplication, would vitiate Euclid's whole system of proportion.

But the oldest testimony, both to the existence of the definition, and the meaning of the disputed word, is Eutocius in his commentary on book ii. prop. 5 (of Torelli, 4 of preceding editors). He here cites, expressly from the elements, the definition as given; and adds, as the explanation of the word, 'as in arithmetic,' that it is the number which, by multiplication, turns the consequent into the antecedent. This number, he says, gives name to the ratio, and he cites Nicomachus and Hero as understanding it in the same way. But, he goes on to say, the word is more properly taken when this number is an integer.

Leaving now out of view what Euclid really did write, we shall proceed to consider the subject of composition of ratios, so as to supply what, on any account, was certainly omitted from the editors of the sixth book. Peyrau has omitted it in the Paris edition, because, in his celebrated Vatican manuscript, it is not in the text, but has been added at the side. The Berlin editor admits it in parentheses; and, with great justice, sets this of the most important propositions of the treatise of Euclid from the ordinary mode of weighing the evidence of manuscripts, and there is little doubt this definition must appear as a part of the original text of the Elements. The conclusion by the internal evidence of the passage, and its keeping with the rest of the book, and there is as little doubt that it would be rejected. The meaning of the passage is, apparently, that the ratio compounded of the ratios 7 to 4 and 6 to 11, the ratio compounded of those ratios is to be the ratio of 7×6×4×11; or possibly, expressing the above ratios as those of 7 4 to 1, and 6 11 to 1, the compound ratio is that of 5 7 11 to 1.

In the early translations from the Arabic, the definition is omitted, and reference is made in demonstrating vii. 23 to a note inserted among the definitions of the fifth book, which is very insufficient. But the phrase there is that the ratio of f to g is produced from those of f to g and g to h: and to the definitions of the seventh book several are added, one of which is, that in a series of numbers the ratio of the first to the last is produced from the successive ratios of each to the one following.

In many manuscripts there is a scholium preceding the sixth book, which August, the Berlin editor, though not admitting it into Euclid, thinks must be of high antiquity; in which, however, he agrees with him. It is to be found in the Beadle edition, and in the notes to the Berlin. This scholium, while it gives confirmation to the preceding view (which hardly wants it), takes the same side on the meaning of the word ratio as we have done. [RATIO, P. C.] And we find that Wallis was the person who suggested to Gregory quantitas instead of quantitas as the translation. See his discussion of this point at length in his English Algebra (1684), ch. 19 and 20; revised in his Latin Algebra (Works, vol. ii. ch. 19, 20), and again at p. 665 of the same volume, where there is a defence of this definition against Henry Saville, who (Præfacium, in Excursus) had considered it a great defect. To the text of Euclid we have only further to say, that this consent of Saville, Wallis, and Gregory, as to the genuineness of the definition in question, is of great weight. But with respect to the matter of the definition we agree entirely with Saville. The word ratio needs definition quite as much as the term composition of ratios itself. This definition, it will be observed, either restricts the composition to ratios which are of commensurable magnitudes, or implies and assumes the multiplicity of two interminable decimal fractions. An old scholiast on Euclid (cited from Dassypodium by Melbonius and Wallis) is of opinion that ratio is understood rather than the more technical word ratio; and, if truth be understood in a wider sense, so as to include fractional and incommensurable ratios. That is, as Wallis ex-
being integer numbers: it being known that every commensurable ratio is expressible by the ratio of two integer numbers. Take any magnitude \( P \), and alter it in the ratio of \( m \) to \( n \); it becomes \( n \)-nths of \( P \). Alter this in the ratio of \( a \) to \( b \); it becomes \( a \)-a-bths of \( P \) which would also be obtained by altering \( P \) in the ratio of \( a \times m \) to \( b \times n \). Hence composition of numerical ratios is performed by multiplication of the antecedent and consequent, and of the consequents for a consequence. The process that is merely equivalent to that of the multiplication of fractions.

If \( \frac{a}{b} \) and \( \frac{c}{d} \) were called the quantuplicate (quantitruncatur) of the ratios, then the quinquuplicate of the compound ratio is the product of the quinquuplicate of the components, as in the definition (be it Euclid's or no) which is found in the manuscripts of the elements.

Duplicate ratio (\( \frac{a \times b}{c \times d} \)) has been defined by Euclid in the manner hereinbefore given. But it is in fact the ratio arising from the composition of two equal ratios. Suppose we want to compound the ratio of \( P \) to \( Q \) with the ratio of \( P \) to \( Q \). Take a magnitude to begin with, which may as well be \( P \) itself: alter it in the ratio of \( P \) to \( Q \); it then becomes \( Q \). Alter \( Q \) into \( R \) in the ratio of \( P \) to \( Q \); that is, let \( R \) be a third proportional to \( P \) and \( Q \). Then \( P \) is changed into \( R \) at these two steps. Each involves an alteration in the ratio of \( P \) to \( Q \); hence Euclid's duplicate ratio is the compounded ratio of two equal ratios; and, similarly, triplicate ratio (\( \frac{a \times b \times c}{c \times d \times e} \)) is that compounded of three equal ratios.

The subduplicate, subtriplicate, sesquiplicate, &c. ratios, which later geometers used, completed that language of multiple and submultiple applied to operations of powers, which roots which finally suggested the idea of logarithms. (See also Additions to Ratios, P. C.)

The propositions requisite for the establishment of the direct use of compound ratio are contained in the fifth book. But in the inverse use there is a manifest hiatus in the converse part of vi. 22. It is supplied by a lemma added at the end of the proposition; which is found in almost all the manuscripts (even in the Vatican manuscript, where it is more correctly). This is a pretty sure sign that Euclid did not give the lemma; for he never refers to anything which is to come after what he has in hand. Robert Simson omits this lemma, and so leaves the proposition undemonstrated. What is wanted is the following:—It is impossible that the same ratio should be the duplicate ratio of two different ratios; or, if \( A \) be to \( B \) in the duplicate ratio of \( A \) to \( X \), and also in the duplicate ratio of \( A \) to \( Y \), then \( X \) and \( Y \) must be equal. If possible, let them be unequal; say that \( X \) is the greater:

\[
\frac{A \times X}{B} \quad \frac{A \times Y}{B}
\]

Then because \( X \) is greater than \( Y \), the ratio of \( A \) to \( X \) is less than that of \( A \) to \( Y \). But the ratio of \( A \) to \( X \) is that of \( X \) to \( B \); and the ratio of \( A \) to \( Y \) is that of \( Y \) to \( B \); therefore the ratio of \( X \) to \( B \) is greater than that of \( Y \) to \( B \); therefore \( X \) is greater than \( Y \); but it is also greater, which is absurd. Consequently \( X \) and \( Y \) cannot be unequal, &c. By a continuation of this process it may easily be established that a given ratio can only be the triplicate of one ratio, only the quadruplicate of one, and so on.

It is unnecessary to say anything on the decomposition of ratios. Just as it becomes in arithmetic, after a while, that every multiplication is a division and every division a multiplication, it is much clearer from the beginning, in this subject, that every composition is a decomposition, and every decomposition a composition. Suppose \( \frac{a}{b} \) to \( \frac{c}{d} \) is the ratio compounded of \( A \) to \( B \), and \( C \) to \( D \), and we wish to return back again to the ratio of \( A \) to \( B \). We must compound the ratio of \( P \), with that of \( D \) to \( C \); for it is easily made obvious that the ratios of \( C \) to \( D \) and \( D \) to \( C \) compounded give the ratio of a magnitude to itself, the ratio of equality, the use of which effects no alteration.

It is now easy to see that all the operations of algebra which spring from multiplication inclusive, must be represented in geometry by operations of composition, &c. Robert Simson, who, as we have seen, has left a demonstration of the sixth book absolutely unfinished, though "Theon or some other" had provided it, for it which seemed to be what was wanting, has thought it necessary to add some very complicated propositions on compound ratio at the end of the fifth book. If they were intended as illustrations of the great difficulty of rendering the compound propositions of algebra into geometrical language (and what else could have been meant it is hard to imagine) the geometrical equivalents should have been introduced. Take the proportion \( K \), for instance, which it may safely be added to no beginner ever fathomed. The foregoing is an illustrative case of it. If

\[
\frac{a \times c \times e}{b \times d} = \frac{x}{y} = \frac{\alpha}{\beta} = k
\]

And \( a \times c \times e \) \( b \times d \) = \( k \times l \)

Then \( e \times g \)

\[
\frac{a \times c \times e \times k \times m}{b \times d \times f \times h} = o
\]

REAU R I M U R I A Z E, A natural order of plants belonging to the Exogenous class. It has a 5-parted calyx, surrounded externally by imbricated bracts; 5 petals, hypogynous, un-echinoid, sometimes having a pair of membranous plates planted upon their middle; definite or indefinite hypogynous, monadelphous, or polyadelphous stamens, with or without a hypogynous disk; the anthers ovate, turned inwards, and bursting longitudinally; 2-4-6 carpels, partially separate from each other, surrounding a central placenta which passes into the base of each; 2 or 4 ascending anatropous ovules, with filiform or subulate styles; a carpulifer with 5 to 6 valves and as many styles; the two styles, upon two stigmas; plants erect; short slender erect flowers, with a straight embryo surrounded by a small quantity of mealy albumen, and the albumen not very much. The species of this order are small shrubs, with fleshly scale-like leaves, and have no stipules, and are overspread by resinous glandular hairs.

This little order consists of three genera, Resunaria, Hololachna, and Eichwaldia, which were formerly referred to Tamaricaceae; they have, however, but little affinity with that order. Their true affinities seem to be with Hypericaceae, near to which Lindley has placed them. The species are generally natives of the coast of the Mediterranean, and of salt plains in the milder parts of northern Asia.

The genus Resunaria was named by Fiseau in honour of René Antoine Percheron de Resun. (REAU R I M U R I A Z E, P. C.) It has a 5-parted involucrated calyx; 5 petals, permanent, furnished at the base on each side with a ciliated appendage; numerous pendulous stamens; 5-6 stigmas; a 5-valved capsule, with valves easily separating from the septa, and shaggy seeds.

R. termiculata has subulate semitericate imbricated leaves, crowded on the branches. It is a native of Sicily, Bombay, and Egypt. This plant resembles Salacia fruticosa. It is used at Alexandria as a remedy for the itch, being bruised and applied externally, and a decoction taken internally.

R. hypogynus has lanceolate flat rather remote leaves. It is a native of Syria and Persia. These leaves are elegant little shrubs of easy culture, which thrive well in a mixture of sandy loam and peat; and young cuttings will grow freely in almost any soil.

Hololachna (from holo, entire, and \( \lambda \chi \nu \nu \), wool, or thick hair) has a 4-5 parted calyx; 4-5 petals; 8-10 hypogynous monadelphous stamens inserted into an hypogynous gynoecium; 4-5 short subulate styles; the receptacle at first globular, 2-4 valved, 2-4 seeded; the seeds few, large, surface shaggy. The only species is \( H. \) Somparia, found by Ehrenberg in the Soomparian garden of Siberia. In cultivation this plant requires to be watered with care, and allowed to dry out. All the plants of this order abound in saline matter in their tissues.

(Lindley, Vegetable Kingdom; Don, Gardener's Dictionary; Lindley, Flora Medica.)

REBEATE is the old English word for Discount [P.C.]. The discounting of a sum of money, or the paying something less for it before it becomes due, is now always done by striking off a certain per cent. Thus, if a sum be due a year hence, say 100L, discounting at five per cent. means paying 95L in lieu of 100L a year hence.

There are one or two old difficulties connected with discount, which we intend, so far as we understand them, to notice under other heads. The first is that of the equation of payments. Were it not for the difficulty, and its principle, this would not be worth notice. It was at one time the custom of the works on arithmetic which preceded this, to pay sums of money due at different times, at what time the total amount is to be paid at once, in such manner that the receiver may gain, by the sums which are prepaid, what he loses by those which are overdue.
To take a simple case, say it is understood that money makes five per cent. simple interest, that 100l. is due in three years, and 400l. in seven years. The rule as it was given leads, as the reader knows, to the payment of the whole 400l. in six years; by which the interest on 300l. paid a year before its time balances on that 100l. paid three years after its time. It is not fair; for not interest, but discount, should be allowed for the sum paid before it is due. That is, the 400l. paid at the intermediate time should yield 100l. due + interest on it since it was due + a sum which put out to interest will make the 300l. at the end of the seven years. The rule for this case gives a result 5.9615574 years, instead of six years; which will be found to satisfy the conditions.

In truth, however, it depends entirely upon what the notion of fairness is, whether one rule is better than the other, or whether either will do. And it must be remembered that simple interest is a fiction in real business. A creditor cannot demand more than simple interest by law; but it does not therefore follow that because certain money is paid under the name of interest, the receiver will let it lie barren in a bag. But what we say is this: keep to the fiction on which both rules are constructed, let all interest-money remain barren, and the two rules will come to the same thing in the end. And it is not fair to construct rules on the supposition of simple interest, and then to complain of the inaccuracy of these rules to represent the results of real business. Remaining by simple interest, let us see how the receiver will stand at the end of the seven years, upon the different suppositions.

1. If no equation of payments be made, he will have 100l. + four years' interest + 300l. just received, 420l. in all, with which he is to go on making interest on 400l. only.

2. If he receive by the first rule 400l. at the end of six years, he will at the end of the seventh year have 420l., or which 400l. is to go on at interest as before.

3. If he receive by the second rule he will have at the end of the seventh year (100l. + 2961l. interest) which he received + 1308l. years' interest which he makes on the 100l. (the other part not making interest) + the sum which will in 1308l. years yield 300l. (285.19l. + ...) + the interest on this. That is, 420l. altogether, of which 290l. is interest only: for the last-mentioned item, though gained in the manner of interest, is discount intended to make up a principal.

Or, if any one will not admit this last distinction, then the approved rule puts the receiver in a worse position than the old rule.

The fact is, that if equation of payments were ever made, it ought to be supposed that all money, principal and interest, becomes productive money to the receiver from the moment it is received: or compound interest should be supposed. This puts the parties into a state of equity at all times, both during the longest term of debt and after. To show this suppose that A is due at the end of a years and B at the end of b years, interest being r per pound. To satisfy this debt by a sum A+ B paid at x years from this time, the equation to determine x is

$$A + B = A(1+r)^{-x} + B(1+r)^{-x}$$

and the receiver of the equated sum, x years after its receipt, or x+m years from the present time, will have $$(A+B)$$

$$(1+r)^{-x}$$

or

$$A(1+r)^{-x} + B(1+r)^{-x} = x$$

And this is precisely what he would have had from the payments themselves. And the accumulations or present value of the equalized sum at all times equal to the accumulations or present values of the payments.

There is another remarkable case of the same kind, in which discount at simple interest is compared with notions derived from compound interest, and where it is seen to be false which is, upon its own hypothesis, perfectly true. The value of an inerrainable annuity, calculated at simple interest, comes out infinitely great: or no sum is large enough to pay t.

Now it is easy to see how such a sum of 1l. a year, at 5 per cent. for ever. And this may even be called simple interest, for at the end of a year the interest of the 20l. is paid away, and the original principal only remains: so that there is no interest upon interest. But the truth is, that in the construction of all rules at simple interest, the money is arbitrarily divided into two parts, productive and unproductive, and a rule which expressly requires payment to be made from time to time out of the productive part, may produce very different results from another in which the unproductive part is paid away first. Now take the case of an annuity for three years, of 1l. money making r per pound. The ordinary rule gives

$$(1+r)^{-1} + (1+2r)^{-1} + (1+3r)^{-1}$$

At the end of a year, this becomes

$$1 + r + r^2 + r^3$$

The first term is partly principal, partly interest: and of annuity has become due. But the manner in which the rule was framed does not allow us to pay away the r(1+2r) and r(1+3r), which are never to make interest again, in part of the first year's annuity, but requires that the 1, part of which will make interest, should all be so paid.

And, when the productive money is broken in upon before the unproductive is all gone, it is perfectly true that no sum is large enough to pay a perpetual annuity: and, if this be done, not only may the rule for a perpetual annuity be objected to, but with as much justice that for a finite term of years. For instance, at 10 per cent., an annuity of 1l. for five years, is worth, according to the usual simple-interest suppositions, 25926l. A year's interest is 398381l. If this is paid away, and the balance of 1l. made up out of the principal, and so on, and it will be found that there is a sum in hand at the end of the ten years: in fact 279075l. will in this way be enough to meet all demands. But the manner in which the rule is constructed supposes the annual demands to be made up out of principal and interest in the following way, the sums before the lines showing how the pound yearly accruing due is raised, partly out of principal, partly out of interest:

<table>
<thead>
<tr>
<th>Principal</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>398361</td>
<td>38926</td>
</tr>
<tr>
<td>Pay 99099</td>
<td>+ 99099  = £1.</td>
</tr>
<tr>
<td>256352</td>
<td>256352</td>
</tr>
<tr>
<td>Pay 85333</td>
<td>+ 16667 = £1.</td>
</tr>
<tr>
<td>251509</td>
<td>251509</td>
</tr>
<tr>
<td>Pay 76923</td>
<td>+ 23077 = £1.</td>
</tr>
<tr>
<td>138096</td>
<td>138096</td>
</tr>
<tr>
<td>Pay 71429</td>
<td>+ 25671 = £1.</td>
</tr>
<tr>
<td>66667</td>
<td>66667</td>
</tr>
<tr>
<td>Pay 66667</td>
<td>+ 33333 = £1.</td>
</tr>
</tbody>
</table>

While if interest were made to go as far as it could, we should have

<table>
<thead>
<tr>
<th>Principal</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td>398361</td>
<td>38926</td>
</tr>
<tr>
<td>32187 after paying £1.</td>
<td>-32189</td>
</tr>
<tr>
<td>26106 do. do.</td>
<td>-26101</td>
</tr>
<tr>
<td>18717 do. do.</td>
<td>-18711</td>
</tr>
<tr>
<td>10581 do. do.</td>
<td>-10589</td>
</tr>
<tr>
<td>16400 do. do.</td>
<td>-16400</td>
</tr>
</tbody>
</table>

That there would remain -164l.

The truth is, that the rule for annuities by discounting at simple interest is wrong except upon the condition that principal and interest are to be rated in a specified way (which those who understand the formula will easily collect) to meet the accruing demands. And moreover, when interest is to be all disposed of first, before any principal is touched, the rules for simple and compound interest are identical.

RECEPTACULITIDES, a genus of fossils proposed by Defrance, synonymous with Isadaticus of Murchison.
RECORD. [Refining, P. C.] REFINING is a term applied to various processes in the useful arts, and especially in metallurgy, where the substances acted upon are purified by the chemical separation of dross and impurities, and of such foreign matters as may be in combination. The refining process would generally be treated of under Assaying, P. C., p. 495; and further particulars respecting the refining of the more important metals are given under Copper, P. C., p. 602; Iron, P. C., p. 54; Lead, P. C., p. 371; Steel, P. C., p. 28; and Tin, P. C., p. 472. Some writers apply the name of refining to the preparation of cast-steel, noticed under Steel, P. C., p. 3; a process which is certainly analogous, in many respects, to the processes usually undergone by the substances in the first mentioned. The term is applied to the purification of sugar, of which process an account is given under Sugar, P. C., p. 321.

REFLECTION. [Light, P. C.; Optics, P. C.] REFRACTION, DOUBLE. [Polarization of Light, P. C.]

REFUGE, HARBOURS OF. In the year 1840 a Commission was appointed 'to visit the coast between the mouth of the Thames and Selene Bill; to examine the ports with reference to their being available as places of shelter for vessels passing through the Channel in cases of distress from westward gales, and to mark places of refuge for merchant vessels from enemies' cruisers in time of war, and more especially as to their being made stations for armed steamers employed for the protection of our trade in the narrow parts of the Channel.' The result of the Report, but no measures appear to have been taken in consequence.

A Select Committee of the House of Commons on Shipwrecks, in a Report presented in 1843, recommended the formation of a refuge for vessels within the Channel, at the same time stating that they refrained from pointing out any particular situations for such harbours, from a conviction that such situations would be best decided on by a body of scientific and practical persons whose judgment should be specially and exclusively directed to the subject.

On the 2nd of April, 1844, the Lords of the Treasury, on the suggestion of Sir Robert Peel, then First Lord of the Treasury, and the Commissioners of the coast, commissioned two experienced naval and military officers and civil engineers to inquire into the most eligible situations for a Harbour or Harbours of Refuge in the Channel.

The Report of the Commissioners is dated August 7, 1844, and was presented to the House of Commons pursuant to an address dated March 6, 1845. The Treasury Minute under which the Commissioners acted assigned three principal objects of investigation:—1. the selection or formation of Harbours of Refuge for the safety and convenience of vessels navigating the Channel; 2. that in times of war, such harbours should be suitable for ships of constructing new works, as compared with the public advantages likely to result from such works. The Commissioners express their unanimous conviction that additional means of commerce and of naval defence are absolutely necessary. The harbours between Portsmouth and the Thames are only tidal harbours, and none of them is at present accessible to large steamers. The Report recommends certain ports and positions as Harbours of Refuge and Roadsteads, and certain breakwaters and military defences in connexion with them, so as not only to afford shelter to merchant ships, but by means of which, with the advantages of steam by sea, and railroads and telegraphic communication by land, the naval and military force of the country may be thrown on any point of the south-east coast in a few hours.

The following harbours and positions were especially examined:—the North Road; Harwich; Regent's; the Brake, or Small Downs; Dover; Dungeness; Beachy Head, East Bourne, and Seaford; Newhaven; Portland and Weymouth; and Ilfracombe. Of the places four were selected, Dover, Seaford, Portland, and Harwich, of which the Commissioners estimate the expense required for the construction of the works which they recommend as follows:—Dover, 2,500,000; Seaford, 1,250,000; Portland, 500,000; Harwich, 50,000. It is recommended that Dover Bay should be converted into a large harbour by means of breakwaters, with an area of 520 acres up to low-water mark, and a depth of water at least 150 feet wide at the east end. Its situation, four miles and a half from the Goodwin Sands and standing out favourably to protect the navigation of the narrow seas, is particularly suitable as a station for a squadron of ships of war. It is recommended to construct a breakwater in Woodford Road, for the protection of trade and a station for armed vessels. Portland should be converted into a large part of the island facing the bay is crown property, and contains abundance of stone: the holding-ground is exceeding good, and the island has abundance of water for the supply of ships. The island has great natural advantages for defence, and for the formation of a naval and military depot during war to any extent that may be required. Harwich Harbour, formed by the junction of the rivers Stour and Orwell, is stated to have a safe anchorage, and a holding-ground over an extent capable of containing many hundred ships. By the construction of a breakwater and dredging to get rid of certain shools, the Commissioners consider that it might be converted into one of the finest and most useful harbours in the kingdom.

The military members of the Commission recommend that casemated batteries be constructed on the breakwaters themselves, supported by defences on the shore flankng the approaches to the breakwaters and harbours.

At the end of the Report, W. Symonds, Surveyor of the Navy, says: 'I am present from this Report, because I consider the mass of evidence to be in favour of Dungeness, and because I cannot recommend a large close harbour at Dover, where the pilots consider the holding-ground generally indifferent, and a very considerable portion of them appear to be in favour of Dungeness, the Commissioners say that it is remarkable for its good holding-ground, and that 300 sail have been well sheltered in the East Bay at one time, and that more than 100 vessels may be sheltered there. However, this latter part of the Report is a matter of opinion; and at a sitting of the Commissioners, which was on the 14th of November, the Commissioners say that they have considered the report of Dungeness, and that 300 sail have been well sheltered in the East Bay at one time, and that more than 100 vessels may be sheltered there. However, this latter part of the Report is a matter of opinion; and at a sitting of the Commissioners, which was on the 14th of November, the Commissioners say that they have considered the report of Dungeness, and that 300 sail have been well sheltered in the East Bay at one time, and that more than 100 vessels may be sheltered there.

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The Report of the Commissioners on the Subject of Harbours of Refuge, 1845.)

REGISTRATION OF BIRTHS, DEATHS, AND MARRIAGES. Parish registers were not kept in England till after the dissolution of the monasteries. The 12th article of the injunctions issued by Cromwell, Henry the Eighth's secretary, in 1538, directs that every clergyman shall, for every church, keep a book wherein he shall register weekly every marriage, christening, and death, any neglect being made penal. In the first year of the reign of Edward V. (1547) ecclesiastical visitors were sent through the different dioceses in order to enforce various injunctions, and, among others, that of Cromwell with respect to parish registers. In the beginning of Elizabeth's reign this injunction was repeated, when the register was required to maintain a register in which, among other things, they promised to keep the register-book in a proper and regular manner. In 1894 an Act (6 & 7 Wm. III. c. 6) for a general registration of marriages, births, and deaths, with the expense whereby for public use, was entitled 'An Act for granting to his Majesty certain rates and duties upon Marriages, Births, and Burials, and upon bachelors and widowers, for the term of five years, for carrying on the war against France with vigour.' It is a very long Act, in which the duties are minutely set down. A supplementary Act was passed (9 Wm. III. c. 82) entitled 'An Act for preventing frauds on the register-book, and for paying the duties upon marriages, births, burials, bachelors, and widowers.' The 52 Geo. III. c. 146 (28 July, 1813) entitled 'An Act for the better regulating and preserving parish and other registers of births, baptisms, marriages, and
burials, in England,' made some alteration in the law, chiefly with reference to having the books made of parchment or strong paper, and to their being kept in dry and well-painted iron chests.

The Registration Act (5 & 7 Wm. IV. c. 86: 17 Aug., 1836), entitled 'An Act for registering Births, Deaths, and Marriages,' was passed on the 17th of August, 1836. By the 44th section of the 5 & 7 Wm. IV. c. 86, entitled 'An Act for Marriages in England,' the provisions of this Registration Act are extended to the Marriage Act.

The general register of marriages made under the provisions of the Registration Act are the following: -- A general register-office is to be provided in London and Westminster (§ 2). Lord Treasurer and Lords Commissioners of his Majesty's Treasury to appoint officers, and register books to be filled and certified copies given (§§ 3 and 4). Regulations for conduct of officers to be framed under Section of the Secretary of State (§ 5). Annual abstract & registers to be laid before parliament (§ 6). The guardians of the poor of a union or parish shall, on the 1st of October, 1886, if the board is established at the passing of the Act, or, if not, within three months after its establishment, divide the union or parish into districts as directed by the registrar-general, and appoint registrars and superintendent registrars, if the clerk of the guardians will not or cannot execute that office (§ 7). Register-offices to be provided in each of the districts, and appointments of the officers of the superintendent-registrar (§ 9). Temporary registrars and superintendent-registrars to be appointed, for parishes not having guardians under the Poor-law Act, by the Poor-law Commissioners (§ 9). Any party may make an appointment to be vacated (§§ 10 and 11). Deputy-registrars may be appointed by the registrars (§ 12). All books, &c., to be transferred on removal of registrar or superintendent, under a penalty of committal to gaol (§ 16). A penalty and fine to be imposed in the event of being put on their dwelling-houses (§ 16). Register-books to be provided by the registrar-general, for making entries of all births, deaths, and marriages of his majesty's subjects in England, according to the forms of schedules (A, B, C) annexed to the Act (§ 17). Registrars authorised and required to inform themselves carefully of every birth and death which shall have occurred within their district after the first day of March, 1897, and to learn and register as soon after the event as conveniently may be done, without fee or reward, save as hereinafter mentioned, in one of the said books, the particulars required to be registered according to the forms of the said schedules (A and B) respectively, touching every such birth or every such death not already registered (§ 18). After March 1, 1897, parents and occupiers may within forty-two days after birth and five days after death, give notice thereof to registrar; and owners and custodians must do so forthwith in cases of foundlings and exposed dead bodies (§ 19). Parents or occupiers, on being required by the registrar to make such returns, are to make such returns within two days; and all the particulars required to be registered respecting birth (§ 20). Children born at sea must be registered by the captain (§ 21). After the expiration of forty-two days from the registration of births, the registrar of each district shall within six months, on the solemn declaration of the particulars before the superintendent-registrar, who is to sign the entry, and to receive 2d. 6d. and registrar 6s., extra fees; and no registration, after forty-two days, shall be made otherwise than as above, under a penalty of 50l. (§ 22). Births not to be registered after six months, under a penalty not exceeding 50l., and no registration after that date shall be evidence (§ 22). Name given in the birth registration may be registered within six months after registration of birth, on production of a certificate by the registrar (§ 24). Some person present at death, or occupier of house, required to give particulars of death, on application by registrar, within eight days; registrar to make entry of finding of jury upon coroner's inquests (§ 25). Registry of persons dying at sea, containing particulars, to be kept by the captain (§ 25). Registrar to give certificate of death to undertaker, who shall deliver the same to the minister or officiating person, and unless such certificate is delivered the minister must give notice to the registrar; but the coroner may order the registration of death, to give certificate thereof; and if any dead body shall be buried without the certificate of registry or of inquest, and no notice given to the registrar within seven days, the party shall forfeit 10l. (§ 27). Every register to make an account quarterly, to be verified by the superintendent, and to be paid by the guardians, as directed (§ 29). Marriage register books to be provided by the registrar general for ministers (§ 30). Marriage registers to be kept in duplicate, containing the several particulars of schedule C; and every entry made in one register to be recorded in the other register (§ 32). Duplicate and certified copies of registers of marriages to be sent to superintendent-registrar (§ 33). Superintendent-registrars to send certified copies of registers to the registrar-general, and certificates given by the persons keeping the registers, on payment of the fees prescribed (§ 35). Indexes to be made at the superintendent-registrar's office, searches allowed, and any index to be sealed, and shall then be evidence without further proof (§ 36). Ministers, &c., may ask parties married the particulars required to be registered; and willingly giving false information is perjury (§§ 40 and 41). Penalty for not duly registering births, deaths, and marriages, or for losing or injuring the registers, not exceeding 50l. Penalty for destroying or falsifying register-books, or entries therein, or giving false certificates, is felony (§ 43). Accidental errors in registering may be corrected, at any time, on the presentation of the parties (§ 44). Modes of recovering penalties of making false entry of births or deaths are not provided for by §§ 45 and 46. Registers of baptisms and burials may be kept as heretofore (§ 49). Registrar-general to furnish and make rules for registers, and which are to be published in conspicuous places of the unions or parishes (§ 60).

Another act was passed (1 Vict. c. 29—June 30, 1837), entitled 'An Act to explain and amend two Acts passed in the last session of Parliament, for Marriages, and for registering Births, Deaths, and Marriages, in England.' This act contains chiefly of arrangements necessary to extend and improve the provisions of the Registration Act.

Previous to the Registration Act coming into operation it was necessary to divide the country into districts of convenient size for equalizing the labours of the registrars by contracting the area where the population was dense and extending it where the population was thin. The Registrar-general issued a circular letter in September 1836, to the boards of guardians throughout the country, on whom devolved the duty of forming each poor-law union into registration districts, and as the unions differed much from each other in population, ranging from 2000 to 80,000, the Registrar-general left the arrangement to the guardians, and referring them to certain principles for their guidance. Parishes and townships not under the Poor-law Commissioners were formed into temporary districts, or, where more convenient, into a district already constituted in a poor-law union. To each district a registrar of births and deaths is appointed, and also a registrar of marriages; and in each union there is a superintendent-registrar. The district registrar of births and deaths is appointed by the guardians, and is always a resident in the district in which he acts. The registrar of marriages is appointed by the superintendent-registrar, subject to the approval of the guardians.

The total number of registrars of births and deaths at the end of September, 1888, was 2193, of whom 1021 were officers in poor-law unions. At the end of December 1835, the number of superintendents-registrars was 218, of whom 121 were superintendent-registrars of temporary districts; at the same period the number of registrars of marriages was 817, of whom 419 were also registrars of births and deaths. In the first year, under the new Act, there were registered in England and Wales—

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Births</td>
<td>399,712</td>
<td></td>
</tr>
<tr>
<td>Deaths</td>
<td>335,956</td>
<td></td>
</tr>
<tr>
<td>Marriages</td>
<td>111,814</td>
<td></td>
</tr>
</tbody>
</table>

Mr. Finlaison, in an estimate of the number of births, deaths, and marriages, to which, in the year 1887, registrar-general calculated the number of births at 560,085; of deaths at 335,968; and of marriages at 114,947. The approximation to deaths is remarkable, and not less so the deficiency in the number of births and deaths in the first year, which is attributed to the perfection in the registration of births, which seems to have arisen partly from the opposition of interested persons, partly from the erroneous notions of the ignorant, and partly from...
were negligence, has since been in some degree remedied, but is still imperfect.

The registrar-general, in his 6th Report, dated August 10, 1844, states, that four inspectors had been appointed to visit every district into which England has been divided, in order to examine into the mode in which the registrars perform their duties. These inspectors, among other important directions given to them, are required to see that the places of birth or death are accurately recorded; that the ages and professions of those who die are duly registered; that exertions are used to impress upon persons giving information of deaths the importance of producing a certificate of cause of death, in the hand-writing of the medical men who attended the deceased in their last illness.

By the end of 1839 about 350 new registrars had been built, and the use of temporary offices had been sanctioned in many places. The ordnance-office supplied iron boxes for holding the registrar-books of each district. By the end of September, 1838, registrar-books of births and deaths, and forms for certified copies thereof, had been provided by the registrar-general for 2192 registrars of births and deaths; and marriage register-books, and forms for certified copies, had been supplied to 11,694 clergymen of the established church, to 817 registrars of marriages, to 90 registering offices of the Society of Friends, and to 36 secretaries of Jewish scribes. They are each required to transmit certified copies on paper having a peculiar water-mark as a safeguard against the substitution of false entries, every three months, to the superintendent of each district, who transmits, once a quarter, to the registrar-general the certified copies of all the births, deaths, and marriages, which have occurred within the district during the preceding three months. These certified copies, having been deposited in the registrar-office in London, are there examined and arranged; and alphabetical indexes are then formed, and abstracts of them are compiled. In a few years millions of entries will have been made, and yet, for legal or other purposes, it will be as easy to find out the name of any individual from among so great a number as it is to find out a word in a dictionary or a cyclopaedia.

The registration for 1839 was

- Deaths: 480,540
- Marriages: 1,211,083

The improvement in the registration of births, as compared with that for 1838, is sufficiently obvious.

The registrations for 1839-40 and 1840-41 are as follows:

- Deaths: 501,589
- Marriages: 1,244,928

The number of births not registered still amounts to some of the usual annual amount, and the registrar-general is of opinion that the registration of births will not be complete until it is enacted that every father or other person, or some other qualified informant, shall give notice within a fixed period, of a birth having taken place.

In 1841 and 1842 the number of marriages celebrated according to the rites of the Established Church were:

- By special licence: 18
- Licence: 15,729
- Banns: 78,015
- Form not stated: 19,679

Total: 114,871

Other marriages not celebrated according to the forms of the Established Church:

- In registered places of worship: 5895
- In registrar's offices: 2064
- Between Jews: 68
- Between sisters: 118

Total: 6136

In each of the four years from 30th June, 1837, to July 1st, 1841, the marriages celebrated in registered places of worship and in registrars' offices were as under:


The proportion of marriages at registered places of worship and at the registrars' offices has slowly increased, and in 1842 the number of marriages so performed represented a population of about 125,000. The number of births registered in England and Wales for the solemnization of marriages was 2332 on the 30th of June, 1844. They belonged to the following denominations:

- Presbyterians: 198
- Independents or Congregationalists: 903
- Baptists: 559
- Methodists (Arminian): 456
- Methodist (Calvinistic): 26
- Roman Catholics: 204
- Foreign Churches: 5
- Miscellaneous: 40

A parliamentary paper gives the number of marriages, births, and deaths, registered in 1839, 1840, 1841, and 1842, as follows:

- Marriages: 123,150
- Deaths: 388,979

REGISTRATION (Scotland.) The registration of documents in Scotland is a great and important system intimately connected with the titles of real, heritable property, and with the execution of the law. It is thus divided into two distinct departments, which may be considered separately—Registration for Preservation, and Registration for Execution. Registration for Preservation, in its simplest form, is merely the preserving of an attested transcript of any deed in a public register, that thus an authentic copy may be had recourse to in case the original should be lost. Besides the regular statutory records of particular deeds, there are books attached to the several courts of civil jurisdiction, in which parties may for their own convenience register such documents as do not require by any special obligatory law to be recorded. It is a general rule that extracts from such records may stand in the place of the originals when these are not forthcoming, but that a party is not to found on an extract if he have the original deed in his possession and can produce it. In the case of mains, however, and other deeds, of which, as will be seen below, it is not the deed itself, but its registration, that makes the completed title, an extract from the register is the proper document to be produced. There is a certain class of actions, however, to meet which the original must be produced if it be accessible. These are called Actions of Reduction-Improvement. Such an action is raised against the party for the infringement of a deed, by some person, or object, the object is the annulling the deed on some legal ground. As a matter of form, in commencing such an action, the pursuer states, along with whatever other grounds of objection he may have, that the deed is forged, and he desires the original to be produced, that it may be judicially examined. The rule for production of the original is subject to modifications, where the ground of the action is extrinsic of anything peculiar to the original document; and if the original be lost without being intentionally destroyed, the inquiry must proceed on the extract and the other circumstances that can be adduced. It is usual to speak of registration for preservation, as being also for publication; and in this sense, when a book of such a character that to make it effectual in the grantee's favour it must have been delivered to him by the grantor, such registration is in the general case equivalent to the delivery. It will operate in this respect in adjusting questions of competing right, as where a father makes over to one child the property that, in case of his dying intestate, would go to another, and registers the deed. It is, however, to be understood, that registration could be in all cases that complete transference of property which is necessary to bar the claims of creditors under the statutes against alienations to their prejudice by in- 

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and Corporation; but it does not appear to be distinctly settled what may be, with reference to various descriptions of documents, the definition of a grant (if such an estate was trans-ferred in heritage, i.e. property, the latter the attestation of the extinction of a burden, i.e. of the devolution of a temporary estate on the person entitled to the remainder. This system is such that the execution of a will or the main operative principle is, that when a title to land appears on the register, no latent title derived from the same authority can compete with it, and that registered titles rank according to the date of entry. The Act of 1617 directs the Register to execute the proper conveyance, and subsequently sell the same property to C, if C get this title first recorded; it cannot be questioned by B, who has only his pecuniary recourse against A. In this system of transactions regarding land, the public records are relied on as affording the means of ascertaining the character and title, and after they have searched for the period of prescription, or examined over a period of forty years (Paxman v. Paxman, R. C. S.), parties can trust that there are no latent rights, and may safely deal with the person who professes to dispose of any right connected with it. The origin of this system may be traced to the commencement of the sixteenth century, when the notaries were required to record their proceedings in their protocols, and the other officers connected with the feudal transfer of land were bound to make returns of their dealings made by them, render the subsequent alienation done for great sums of money altogether unprofitable; which cannot be avoided unless the said private rights be made public and registered in the proper place. The Act then appoints the scribes, revisions, &c., to be registered within three days after execution, otherwise they are to make no faith in judgment, by way of action or exception, in prejudice of a third party, who hath acquired a perfect and lawful right to the said lands and heritages: But prejudice always to them to use the said writs against the party maker thereof, his heirs, and successors. By the other clauses of the Act the superintendence of the system is given to the Clerk-Register, and the country is divided into Registration Districts. There is one defective provision in this Act, which is still in force. Parties are allowed to register their titles either in the Register for executions of the General Register at Edinburgh. It is unusual to adopt the latter alternative, and when it is followed, it is generally for the purpose of concealing instead of publishing the transaction. There was one case in which the Register had the necessity of registering a mortgaged estate in order that the mortgagee might have his title immediately registered, but was liable to have it superseded by any other person able to register a title on a warrant previously obtained. This was remedied by the Act 1628, c. 15, which gave the registered titles priority not according to the date of their execution, but to that of their registration. To prevent injustice by the accumulation of unregistered deeds at the office, a minute-book was, by a contemporary Act, appointed in Edinburgh, in which the Keeper enters an outline of each document as it is presented to him. By the present practice, when a saioe or other writing belonging to this register is presented to the keeper, he marks in the margin of the minute-book that the document is endorsed on the deed itself, and marks the date of registration. When the deed is engrossed at length in the register, a certificate to that effect is endorsed on the deed, mentioning the pages of the minute-book on which the deed is registered, and the deed is then returned. Registration volumes, with minute-books accompanying them, are from time to time issued from the General Register house, the keeper of the District Register retaining a copy of the minute-book for general reference. The real titles of all the heritable property in Scotland are thus preserved in a register and indexed, in the General Register-house at Edinburgh. When property is office by any estate, there is a search of records in all the districts for the titles offered for registration, in order to ascertain the rights of the parties treating for it. This is a certificate by the proper officer, describing all registered documents regarding that land, which have been recorded during forty years. The documents that the property may have been lately been much simplified and abbreviated by the Act 8 & 9 Vict. c. 33. It has to be kept in view that the title which may derive from the same authority within the sixty days only gives a preferable title. It is not necessary to create a title, and if the receiver of a conveyance have an absolute reliance on the integrity of the grantor and all persons through whom the deed has descended, he is not required to inspect the register before him. The simplification of the documents to be registered tends to lessen the temptation to delay their completion and registration. It is remarkable that the enlightened mind of Cromwell appears to have comprehended the utility of this system, and that he made an effort to introduce it into England. We are told by Ludlow (Memoirs, I. p. 436), 'In the meantime the reformation of the law went on but slowly, it being the interest of the lawyers to preserve the lives, liberties, and estates of the whole nation in their own hands, so that upon the debate of registering deeds in each county, for want of which within a certain time fixed after the sales, such sales should be void, and being so registered that land should not be subject to any incumbrance, this word incumbrance was not used in any other act till it took up three months' time before it could be ascertained by the committee.'

Registration for Execution of another peculiarity of the law of Scotland, although the system of warrants to confess judgment in England in some measure resembles it. The party to a solemn deed incorporates with it a clause of registration, by which, on the deed being registered in the books of a court competent to put the deed in force, the decision of the court shall be held as pronounced in terms of the deed, and execution may proceed against the party on an extract, as if it were the decree of a court. The engagement on which such execution may issue must be very distinctly set forth. Thus, if it be for payment of money, it must be for a sum named in the deed, and not for the balance which may be due on an account arising out of the transactions to which the deed refers. This method of execution was by statute (1861, c. 20) made applicable to bills and promissory notes without their containing any clause of registration. To entitle it to this privilege, the bill or note must be apparently without flaw, must bear the appearance of due negotiation, and must have been protested. The operation of this system was much widened by the Act 1 & 2 Vict. c. 114, which extended registration for execution purposes to France, Spain, and Portugal.

REGISTRY OF SHIPS. [Sips, P. C.]

REGNARD, JEAN FRANCOIS, was born at Paris, according to most accounts, in 1647, though in a short biography prefixed to a translation of his 'Meditations' (Paris, 1830), he is said to have been born in 1656. An only son and heir to considerable wealth, he received an education qualified to fit him for the position in life he was likely to occupy. The death of his father soon after he had completed his studies enabled him to gratify his desire for travelling. The first country that he visited was Italy, where he spent the year 1678, a date which, connected with other circumstances, renders it probable that 1676 was the real year of his birth. He revisited Italy a second time in 1678, on which occasion he formed an intimacy with the Eloise, whose memory he has consecrated in his pleasing little novel entitled 'La Provencale, the novel published at Algiers, which is described by the lady and her husband were induced by him to visit France, and for that purpose they all sailed from Civita Vecchia in an English vessel bound for Toulon. On the voyage, however, the vessel was taken by Algerines, and Regnard and his companions were taken captives to Algiers. The adventures of their captivity form the basis of the novel above mentioned, and they are sufficiently interesting and romantic in their own way to deserve the copyists who have set down the tale, as proceeding from the pen of Regnard. The only talent of Regnard which became serviceable to him on that occasion, was one which his love for good fare had excited, and his wealth had enabled him to gratify, the skillful preparation of which, according to the principles of Parisian cookery. His culinary abilities secured for him the good will of his master and the favour of the

§ 1'2
ladies of his household. During his captivity he was taken to
Constantinople, where he remained two years. On his re-
turn to Algiers he was ransomed for a considerable sum by
the French consul; a ransom which he carefully pre-
served. He returned, however, not having been allowed
by his unlucky adventures, and, on the 26th of April, 1681,
be set out from Paris on a journey over the north of Europe.
On arriving at Stockholm he was induced by the King of
Sweden to visit Lapland. His remark there by way of
Tornea, ascended the river of that name, and reached the
borders of the Frozen Ocean. On one of the rocks of the
mountains, amidst the summit of his excursion, he engraved
the following Latin verses.

Qulla nos genti; sive nos Africis; Gangues
Hastaeus, Capraces occisuum instruximus amnem,
Custoda in animi acta ibique magnis, etc.
Hic tandem stetimus nobis ab defunct orbis.

(Anno 1681, die 22 Augusti).

On his return from Lapland he made a short sojourn at
the Court of Sweden, and, after having travelled over
Poland, Hungary, and Germany, came to Paris on the 4th of Decem-
ber, 1688, where, satisfied with the wandering life he had
led, he determined upon settling. Having purchased some
land about seven leagues from the town, he bought a house
under government part of his time to literary pursuits, but spent the greater part
of it in the society of his friends, and in the enjoyment of the
capital; the summer he was in the habit of passing on
an estaminet called 'the tavern near Paris. He has given
ample details of his manner of life, in his 6th epistle and his
'Mariage de la folie.' His devotion to gaiety and pleasure,
as it was the means of lessening his utility and reputation
as a writer, was the cause of his untimely death, which occurred
on the 5th of September, 1710.

As a dramatic writer, the reputation of Regnard stands
deservedly high; in comedy he is generally considered second
to that of Molière. Voltaire has remarked that 'a reader can appreciate
that great dramatist who feels no pleasure in reading
Regnard.' His finest and most perfect production is the comedy of 'le Joueur,' written in 1696; some scenes in it,
more especially the thirteenth scene of the fourth act, are
equal to anything written by Molière. Himself a gambler, he
has given a dark but faithful colouring to the portraiture of
a vice which had embittered his life, and he has translated his
own sentiments on the subject into the language of the
most beautiful and energetic poetry. His next best piece
is 'le Légataire Universel,' in five acts, in which the humour and the
verisimilitude are alike deserving of admiration. (P. C. vol.
ix. 421.) Had Regnard produced many comedies of
similar merit to the two which we have mentioned, he would
have relieved French literature of the reproach which has
often so justly adhered to it of having had no Molière.
The fault into which he has fallen is that, like
Piron, Greart, and Marivaux, he has rather delineated an
exaggerated representation of some particular vice or folly
than, like the great original, human nature in its every-day
proportions. This fault however is still more conspicuous in the French
dramatists who succeeded him, whose portraits are,
in most instances, only coarsely drawn caricatures of
nature.

The other dramatic writings of Regnard, in five acts, are,—
1, 'le Distrato,' which appeared in 1697, and is taken from
one of the characters of La Bruyère. This piece failed on its
first representation, but was re-staged in 1731, reproduced
in the French stage with considerable success. 2, 'Démocratie'
(1700). 3, 'Les Ménechmes' (1705); a comedy dedicated by
the author to a friar on a reconciliation with him which his
friends had effected; between these two poets there had
been a long literary warfare [Boltz, P. C.]; it is rather an imitation of the Ménechmes of Rotrou than of the
antique comedy of Plautus. His shorter pieces are in prose;
the principal of them are,—1, 'le Divorces,' in part of Paris
(188). 2, 'la Descente de Messiz aux Enfers' (1689). 3, 'l'Homme a bonnes Fortunes' (1690); Regnard has also
written another of this comedy in a French piece of one
act which was represented in the same year. 4, 'Les Filles
Étrangées' (1690). 5, 'la Coquette' (1691); all in three
acts. 6, 'Les Chiots' (1692), four acts, and several one-
act pieces. 7, 'Cœur de Reine' (1688), a pastoral comedy
in five acts. He also wrote an opera entitled 'Le Carnaval de Venise'
(1899), the music of which is by Campra, and a tragedy
called 'Saporo,' which has not been represented. His other
works are some Epistles and two Satires, one of them
directed against Boltz, another against husbands, which
have been much admired in several shorter poems. He
has composed a relation of his various travels, and the
Provencale already alluded to.

The best editions of his works are those by Lequien,
published in 4 vols. 8vo, in 1723, 2 vols. 8vo, in 1722 and
1723, 6 vols. 8vo.

REGULATORS OF MOTION. Fly wheels are the means
usually employed to render the movements of machines
as nearly as possible those of the wind, as in the
applications of these have been described under WHEELS,
(P. C. p. 316, col. 2), and under Steam-Engine (P. C.
p. 447, col. 1). Pendulums, as regulators of clock-wheels, are described under Pendulum (P. C.); and
the Governor, by which the supply of steam is regulated, has been
described under Steam-Engine (P. C., p. 410, col. 1). Some
account of air-vessels for regulating motion in the
tread-wheels, which are employed in prisons, has been given under
Air-Vessels (P. C. S.), and it may be added that a particular
kind of fly has been occasionally used for the like purpose.
This consists of a vertical rod about 20 feet long,
carrying at its upper extremity, on opposite sides, a long
rectangular frame, which is provided with shutters turning on
hinges; by the revolution of the shaft these frames turn
round horizontally, and by the lead of two governor balls by means of wheel-work, when the motion of
the tread-wheel becomes too rapid, the diverging balls
cause the shutters to close, and thus the resistance of the air
is diminished. Similarly, when the movement of the tread
wheel become too slow, the balls collapsing allow the shutters
to open, when the resistance of the air is diminished and the
velocity of rotation increases.

REICH, ANTOINE-JOSEPH, a musical composer
and theorist, was born at Prague in 1770, and having in his
infancy lost his father, was educated first by his uncle, and
finally at the university of Bourn, where he very successfully
pursued the study of several branches of the liberal
arts, and received his degree of "maître de chapelle" to the Elector of Cologne, placed his
nephew in the same service. On the French invasion in 1794
Reicha sought refuge in Hamburg, and there composed an
opera, 'Oedipe, ou les Français en Egypte,' but it was not
represented. He then repaired to Paris, in 1798, but failed.
in his endeavour to obtain a hearing for his work, on account
of the feebleness of the drama. However he there produced
a grand symphony which met with success. In 1802
he proceeded to Vienna, and resided six years in that capital,
enjoying the friendship of Haydn and Beethoven. During
that period he published an Oratorio, and a collection of
figures. On the invitation of Prince Louis Ferdinand of
Prussia, who was a superior performer on the piano-forte,
and who desired instructions in composition from Reicha, he
prepared to go to Berlin. The amiable prince obliged him to change his intention. In 1806
he returned to Paris, and gave a course of lectures on compo-
sition, which were well attended; and some quintets for
wind-instruments which he there produced, were much ad-
mired. But an opera, 'Caglistro,' which he gave in 1810 at the
Opéra Comique, was allowed only a single representation,
and that a stormy one. In 1816 he produced, at the Académie
Royale de Musique, 'Nathalie, ou la Famille Suise,' and in
1822 'Sappho.' But this able theorist and learned harmonist
did not the talent for creating melody, which genius alone can
produce; and he might with propriety have said to his
declivities, 'Follow my precepts, but not my examples.' He then
prudently renounced the composition of operas; and having
been named professor at the Conservatoire de Musique, on
the death of Mehul, in 1818, he there attracted a numerous class
of pupils, to whom he imparted knowledge, which had
become highly esteemed masters. He originated a method of
instruction more clear and precise than any that had been in
use; and the publication of his didactic works, which soon
made these exquisite compositions by the most refined and
considerable degree improved the study and advanced the know-
ledge of music. These opened to him the doors of the
Institut de France, in May, 1855. Unfortunately for the
science, the public, however raised to this high honour
his death taking place in May, 1836. His chief works on the
theory of music are—1, 'Traité de Melodie,' 4.to. 1814;
2, 'Constitution de la Soprano ou énorme de la Hentzme de Saint Germain,' etc. He
also wrote an opera entitled 'Le Carnaval de Venise'
(1899), the music of which is by Campra, and a tragedy

Dramatique,' 4to, 1835; and many articles on music in 'l'Encyclopédie des Gens du Monde.' (Biographie Universelle.)

RELEASE REMAINDER. [RELEASE AND REMAINDER, P. 521-522.]

REMOLLEURDIES, a singular fossil genus of Trilobites found in the Silurian strata of Tyrone by Portlock, who describes it in his Geological Report on Tyrone.

Italian Renaissance properly so called is occurring, neither this nor the term Cinquecento have found their way into any of our architectural dictionaries. The term Renaissance indicates the period of the Revival, when the classical style began to be adopted as the style of the new age. But this is not the case with the term Cinquecento, which literally means five hundred, whereas it is used as equivalent to mezzo cinquecento, the middle being understood though not expressed, therefore it stands for fifteen hundred, and in its technical sense among artists signifies the style of architecture and general decoration in vogue during the 16th century, or rather the earlier part of it; nor is it so restricted, for without exact reference to date, it also applied to the style so denoted though it may happen to be before the year 1600, which period may be taken as the equator-line laid down by the historians of art. Both terms, however, are now chiefly placed by the foundryman in the common mode of that of cinquecento therefore very loosely and arbitrarily.

Although all were derived from that of Italy, each country has its own Renaissance, described severally in the French, German, English Renaissance, etc. (ELements d'Architecture, P. C. S.), preserving a general family likeness, but exhibiting traits exclusively its own. It is therefore rather simply an Italian Renaissance, or peregrine' and subject to many influences and has treated of it expressly and at due length, instead of merely touching upon it hurriedly. The Renaissance in general is usually spoken of as if it were nothing more than a direct but unattractive imitation of the antique, previously to the orders being so well understood as they were afterwards studied through the text of Vitruvius, and reduced to a methodical system of bookish rules, by Palladio and Vignola. But in the beginning of the 17th century, the ancient arch, order, and in the next, not upon the temple style of the Romans, but their triumphal arches, baths, and other edifices. It was not either the portico, or the continuous colonnade, where columnation displays itself in all its purity, that was taken as a model, but rather such structures as the Colosseum [Amphi- theater, P. C. S.], where several small orders—that is, small in proportion to the general mass—are introduced for little more than decoration to it. And in the Renaissance and Cinquecento styles, entire orders are used only as embellishment, and avowedly so. Where columns are employed for actual support, as in open loggias, it is only in combination with arches spanning the intervening space, and the arches, of course, finishing to the latter; which is regarded by some as one of the most indefensible herey and uter violation of good taste, though for no better argument than that columns were never so employed in the classical style, but ever original in simple proportion to horizontal entablature; in other words, transvection is essential to them. Essential it certainly is to the completion of an entire edifice, whether it be a church, palace, or other building. From this, good taste or good sense to employ columns as actual pillars or supports to arches resting upon them is than to employ the transvection or entablature without columns, as decoration in stayer buildings. [Antwerp, P. C. S.] In fact, a great deal of Italian Renaissance is satyr, with either a full entablature, or a cornice crowned and proportioned to the entire mass. This large and simple mode of treatment was generally given up by the middle of the 17th century, when the period of the revival, and contrasts very strikingly with the Transalpine Renaissance in France and other countries, which is characterized by multiplicity of parts, and numerous divisions and breaks. It contrasts also with the contemporary practice of the Italian architects themselves when they employed the orders, in doing which they made their compositions microcubular, applying a separate small order to each floor or horizontal division of a façade, above the ground floor; and they further reduced the height of the columns by giving a considerable proportion of each order to high pedes- tals beneath the columns. In Transalpine Renaissance such stipulations might be employed for the ground floor as well as the others, and the spaces between the columns being filled in, either entirely or nearly so, with large windows, so that the columns or pilasters between them show only as necessary to the windows them-

selves, and as narrow piers between them. Perpendicular completeness predominates, both as to the quantity of the openings occupy, and the architectural character occasioned by it. One of the earliest importations of the Renaissance into this country, by Longhouse, Wiltz, erected by John of Padua, 1567, and extolled for its fine taste 'displayed in it, is an instance of such mode of composition, and shows how greatly the borrowed style was transmitted faithfully with regard to details, among which may be reckoned the orders themselves, which amount in fact, when so applied, to no more than such.

One deviation from the Italian practice was the frequent em- ployment of coupled columns or pilasters, which was in some cases (as at Wolstanton Hall) caused by the necessity for wider piers between the windows, at the same time that the intercolumnia were completely occupied by the windows, which last, it should be observed, retained their Tudor or English character, being very spacious and divided by mul- tions and transoms.

In much of the Italian cinquecento, especially in that for which purity and correctness were affected, the character of the detail is somewhat dry and meagre, and there is very little ornamentation, even the entablatures in Corinthian and later order modelled from the antique, often by the addition of a fictitious architrave, or some other modification, as it may be distinguished for lack can be said—seems, on the contrary, to have been most in favour both in France and in our country, probably for the consequence of the taste for luxur- ious enrichment which has been indulged during the period of Gothic architecture which the new style was beginning to replace. Besides which, it was there adopted as a fashion that was long being at first employed for palatial and sumptuous structures, it was displayed in all its luxuriance. This florid species of the style and period is marked by a profusion of enrichment and carvings in mouldings and panels, by arabesque foliage and medallions, with surfaces of considerable extent are often times covered. Even the shafts of columns are frequently damasked or broidered, if not for their entire height, for a considerable portion of it, and garnished the lower one, with foliage and other chiselling; besides which they are further enriched by one or more bands embossed in similar manner. The faces both of pilasters and pedestals are also highly decorated by being pannelled, and filled up with arabesque work or other sculptures. Niches, too, are frequent features in composition, and within, their heads are generally carved to resemble a shell. Scenecutous and armorial bear- ings are not spared; neither are devices, motto, and other inscriptions. This profusion of minute ornament is eminently characteristic of the Renaissance taste in building, furniture, and decoration generally; and though it was then carried to an extreme, and the ornaments were too often uncouth, grotesque, and what is understood by the term quiet (oddly picturesque but not beautiful), much of the ornamentation is taken for more or less of fancy; therefore it would not be difficult to refine upon the style by employing it more discreetly—by selecting all its better qualities and elements, and combining them with better taste,—more sparingly. But either way it may be turned into the same composition. But architects have not distinguished between the mere copying of a former style and the free artistic imitation of it by selecting what is valuable in it, and leaving its dross, or by borrowing ideas from it and working them out afresh.

French Renaissance is truly cinquecento, since it may be dated almost with chronological precision from the year 1500, when the reign of Francis I., who was concerned in the French Renaissance, and among others the architect Giocondo [GIOCONDO, P. C. S.], who erected for Cardinal d'Amboise, the minister of that monarch, the celebrated Château Gaillon. Though that edifice—at least what remained of it, was taken down some years ago, it is known from the representations of it, and also from such fragments of it as have been preserved by being reconstructed at the Ecole des Beaux Arts, Paris, to have been an exceedingly sumptuous pile. The buildings towards the court were almost entirely erected over—some would call it 'tatoed'—with pannelled pilasters, arabesque, medall- ions, and other sculptural work. The Château of Louis XIV., restored and decorated by him, was another distinguished work of that period, and probably one of those on which Giocondo was employed. In the reign of Francis I., the culminating point of French Renaissance, the palaces erected by that sumptuous prince and his nobles
attested the magnificence if not the refinement of that age. As a retreat for himself in the immediate vicinity of his capital, Francis built (about 1580) the Château de Madrid in the Bois de Boulogne, whose façades were decorated with coloured bricks or enamelled tiles, constituting a specimen of polychrmic decoration. Of that building nothing now remains, it having been taken down at the end of the last century; but another architectural specimen of the same period, the house or castle of Francis I, erected at Montreuil, near Fontainebleau, has been preserved by being removed to Paris, where it was re-erected in its primitive state, in the Bois de Boulogne, by the architect Biet, in 1825. Of this interesting edifice, the Renaissance spirit is to be seen in the regale, in the polychrmic façade decoration, plans, elevations, and sections, which are given in Normand's "Paris Moderne," but being only in outline, a great deal of the effect is lost in them. The palace of Fontainebleau itself, in its interior at least (now restored by Louis Philippe), records the magnificence of Francis, his taste for splendour, and his liberal encourage-

ments.

In Germany, the castle or rather palace of Heidelberg would, if completed, have been a most gorgeous pile in the Renaissance style, as it showed itself in that country; and therefore the principal portion of the exterior is in sufficiently good preservation to admit of faithful restoration in a series of architectural engravings—and it is infinitely worthier of being so recorded than are the mere shapeless fragments of a few blocks of stone and columns, which are regarded as interesting and curious only because discovered where they were not before known to exist.

The architecture of Spain at various periods is as yet so imperfectly studied that very little is known of its Renaissance edifices; but from the views of some of them in the 'España Artística,' that country would appear to contain several interesting and striking specimens of the kind; and among them may be mentioned, as deserving of particular notice for the elegant taste it displays, the upper gallery of the cloister of the Convent of Huerta.

We may conclude this imperfect sketch by observing that the whole work of study and research will enable us to avoid what was faulty in it, and to catch something of its freedom and spirit without falling into the licentiousness for which it may justly be censured.

REPEAL OF STATUTES. [STATUTES, P. C.]

REPRESENTATION. [DEBENT, P. C.]

REPTON, HUMPHREY, the celebrated practitioner and writer upon his art, who first assumed professionally the title of Landscape Gardener, was born at Bury St. Edmund's, where his father held the lucrative situation of collector of Excise, May 2nd, 1792. After being placed first at the grammar-school at Bury, and then at that of Norwich, he was sent, at the age of fifteen, to sea, who intended to break the business of him, to Gorkum in Holland, in the summer of 1764; a suitable place enough for the future merchant or manufact-urer, to study to a great extent upon which he was ready, according to a remark of Repton's own, to have been his father's chief ambition for him—but almost the very worst for the future landscape gardener, Dutch gardening being the very reverse of picturesque landscaping. At the age of sixteen he returned to England, and was placed in a mer-
chant's counting-house at Norwich, but all his leisure was devoted to poetry, music, and drawing. At the age of twenty-one he married, and was set up in business as a gentleman by his father, and for a while affairs prospered with him; but after a few years took an unfavourable turn, owing to losses of vessels at sea, and other circumstances in trade; wherefore having lost both his parents he was forced to follow his own inclination. He accordingly settled at Sustead, near Aylsham, in Norfolk, where his sister resided in a house left them by their father. The change was to him a delightful one, and there he passed five years of almost uninterrupted happiness, occupying himself with farming ex-
periments, gardening, and the study of rural scenery. An event however occurred in 1753, which promised to open a widely different career from that in which he was now so happily situated; for in that year his friend and neighbour Mr. Wyndham of Felphill was appointed secretary to the Lord Lieutenant of Ireland, and Repton, feeling that as the opportunity offered here was the most likely to cause him greater happiness, and more rapidly increasing family, agreed to accompany him as his confidential secretary. The flattering expectations thus suddenly raised, were as suddenly blighted; for his patron gave up his post almost immediately; and Repton returned to Sustead and domestic privacy. There however he did not long remain, for compelled to retrench, he took a small house at Harestreet, Essex, to which he became so much attached as ever after to reside there. Just at this time (1784) he became acquainted with Mr. Palmer, who had been engaged in one of the great works of his day, and whose project he aided not only by his advice and personal exertions, but by advancing a considerable portion of his small remaining capital. Yet though the scheme prospered, Repton received no remuneration for his attention; and to put up with pecuniary loss. Thus every successive speculation and enterprise of his seem doomed to fail a proof; yet had it not been so, he might never have been heard of unless it had been through his exertions. This was the case. Whims.' Fortunately though easy he was not indolent, neither was he of a desponding temper, and he resolved to try whether he could not extricate himself from his embarrass-
ments by gratifying his own tastes at the same time, and accordingly announced to his friends his intention of practising as a 'Landscape Gardener.' The field was open, for Brown had been dead some years [Baxow's C. S.], and there was no one besides of any note. With this success his last scheme was crowned, heeds hardly he be said, for business soon began to bring upon him, and he was consulted by the owners of 'places' in almost every part of the kingdom.

The list of his Red Books alone—as he called his Reports on the seats whose grounds he was employed to lay out or improve, testifies to the great extent of his professional labours—by—of the character of his work, and the course with polished society, in which his accomplishments and good because unaffectedly amiable manners and address enabled him to sustain a proper part. Nothing proves the real worth of a landscape gardener more clearly than the corruption by sudden good fortune, or by being lifted into a higher sphere: home and domestic tranquillity were still dearer to him; and few had greater cause to be attached to a domestic circle, whose happiness was marred only by the loss of so many of its members, for out of sixteen children, only seven attained the age of manhood, and only five, to-
gether with their mother, survived him, a daughter and four sons. The second in order of merit was his brother, who adopted his father's profession, but is better known as a very able architectural antiquary; the fourth, George Stanley, who, just before his father's death, married a daughter of Lord Chancel-
cellor Eldon, was brought up as an architect.

Among the blessings which fell to Repton's lot, was that of an excellent constitution and uninterrupted good health up to January 29th, 1811, when being up in his carriage, he received a severe injury in the spine, which rendered him a long while an invalid, and he was some time afterwards at-
tacked with angina pectoris, which caused him at intervals great suffering during the remainder of his life, and carried him off three years before his death. He died at his residence on the morning of the 24th March, 1818, apparently in his usual health.

His professional publications consist of 'Sketches and Hints of Landscape Gardening,' 4to., 1755: 'Observation on the Theory and Practice of Landscape Gardening,' 4to., 1803: 'Inquiry into the changes of Taste in Landscape Gar-
dening, &c.' 3vols., 1811: 'Designs for the Pavilion at Brighton,' folio, 1808; (though these designs are said to have been the approbation of the Prince of Wales, and were, like the build-
ing afterwards erected by Nash, in a fancy Oriental style, they were not adopted); and 'Elements on the Theory, &c. of Landscape Gardening,' 4to., 1816, in which he was assisted by his eldest son. These different publications on his art, which at their original price cost collectively 202 26. 6d., and were reduced to 50s. 6d., were readily purchased by P. C. S.), in a single octavo volume, accompanied by a portrait and memoir of the author from autograph memoranda (which has here been made use of). Though this compressed and economical edition must have deplored the attractions of the larger coloured plates, the same subjects being shown in small wood-cuts, it is far more convenient as a volume for perusal and study, and moreover contains several notes and remarks by the editor.

REPUBLICATION. [WILL AND TESTAMENT, P. C.]

RESEDA/CELÉE. A natural order of plants belonging to the class of Exogona. It has a many-parted calyx; the petals unequal, often by the sectional cells; for the sake of the back, an hypogynous one-sided glabrous disk; definite stamens inserted into the disk, the filaments erec, the anthers 2-ovelled, opening longitudinally; 3-lobed 1-ovelled many-seeded sessile ovary, scarcely closed, usually with 3-6 parietal

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placenta, sometimes surrounding a free central ovule-bearing body; 3 gnarled sessile stigmas; campus; oramphitropical ovules; the fruit dry and mealy, open at apex, with empty carpels surrounding a central placenta, or even hooded and 1-seeded; the seeds several, reniform, with a taper arcuate embryo without or with a few white bands. This order is soft herbaceous plants, or in a few instances small shrubs with alternate entire or pinnately divided leaves, and minute gland-like stipules. The flowers are racemose or spiral, with five petals, or rarely more, and ten stamens. The fruits are capsules, berries, or drupes. The genera Reseda, Ochrodon, Oligomeris, Holopetan, Astrocarpus, and Caylusea.

None of the species possess very active properties. Reseda luteola is the Woold, Wood, or Welch, that is used in dyeing.


It has lanceolate bluish entire or trifid leaves, a 6-parted calyx equal in length to the petals, which are finely cleft into many club-shaped divisions, the two lowest simple, the capsules 3-toothed. It is a native of the North of Africa and Egypt, but its delicious fragrance has caused it to be cultivated all over the world. It is naturally a herb, but when trained in the greenhouse it becomes shrubby. This plant is in some gardens, however, trellised, and so is extensively cultivated. The seeds should be sown in pots or transplanted into pots 4 or 6 plants to a pot 4 inches in diameter.

The instructions for growing Caryota, as for a sowing should be made in July, in the open ground, and the plants potted in September. The crop for March, April, and May should be sown in pots not later than the 26th of August; the plants from this sowing will not suffer from exposure to rain whilst they are young; they must however be protected from early frosts like the winter-crop; they are to be thinned in November, leaving not more than 5 or 10 plants in a pot; and at the same time the pots should be sunk 3 or 4 inches in some old tan or coal-ashes and should be covered with a frame, which is best kept placed fronting the west, for then the lights may be left open in the evening, to catch the sun whenever it sets clear. The third or spring crop should be sown in pots not later than the 26th of February. These must be placed in a frame on a gentle heat; and as the heat declines, the pots must be let down three or four inches into the dung-bed, which will keep the roots moist, and prevent their leaves turning brown from the heat of the sun in April and May. The plants thus obtained will be in perfection by the end of May and be ready to succeed those raised by the autumnal sowing. (1858, p. 162)

The arborescent plant is often called Tree-Mignonette. It may be propagated by seeds or by cuttings, which readily strike root. Prune and fence in dead wood. Propagate by root cuttings forward by heat. As they grow they should be tied to a stick, and all side shoots should be pinched off. As the plants attain a greater size they should be shifted progressively into larger pots.

R. phyoema has lanceolate spatulate leaves, the upper ones sometimes a little divided; the calyx 5-parted, spatulate, ciliated, much longer than the petals. It is a native of France, Austria, Italy, Switzerland, and the Levant. This plant is the species of Dioscorides, 4, 128.

R. undulata, a native of the south of Europe, with pinnatifid leaves and linear-lanceolate segments, trifid petals and 3-lobed carpels, is the Reseda pubescens of Dioscorides, 4, 150. It grows at the present day on the way-sides in Attica and Corinth.

R. tuba and R. festucacea are British species as well as R. luteola. The first has 6 very unequal petals and 3-leaf or pinnatifid leaves. It grows in waste places in chalky and limestone districts. The second has 5 nearly equal petals, with pinnatifid leaves, and grows in waste dry places near the sea.

(Babington, Manual of British Botany: Don, Gardener's Dictionary; Burrett, Outlines of Botany; Lindley, Vegetal RESULTING TRUSTS. [Trust and Trustee, P. C.] Rham, William Lewis, was born at Utretch, in the Netherlands, in 1778; and of this country his father was, we believe, a Quaker. He was educated at Westminster School, and came to England in early life. He studied for some time at Edinburgh, with a view to the medical profession, but eventually the church became his destination, and he entered at Trinity College, Cambridge. In 1806, being then in his twenty-eighth year, he took his degree, and his name appears on the Transcript as tenth wrangler. In 1808 Mr. Rham was presented by the Worshipful, worshipful, living of Winkfield, Berkshire; and a few years afterwards the Nassau family presented him to that of Fersfield, in Lancashire. He died in 1845 at Winkfield, after a short illness, on the 3lst of October, 1843.

The life of Mr. Rham was characterized by active and unremitting usefulness as a parochial clergyman. He was the friend of the poor in the district in which he lived, and was always ready to help them under the wants of the moment, and sought the means to improve and elevate as well as temporarily to benefit the objects of his benevolence. At the Winkfield School of Industry, which, under his fostering care and as a kind of shelter and refuge for the institutions in country parishes, the young were taught not only the elements of knowledge, but were instructed in useful arts, and trained to habits of industry. Such were the means by which he endeavoured to promote the best interests of his parishioners.

The school which Mr. Rham founded at Winkfield is thus described by Mr. Tremennheere, in his Report to the Council of Education in March, 1843.

This school was established in 1835 for 50 boys and 50 girls. The building consists of a house for the master and mistress, two schoolrooms, a work-shop, and a lecture-room. It is surrounded by two acres of garden, to which two more adjoining acres are last year added, and which are cultivated, by the master and the boys, with the various agricultural crops, according to the most approved method and system. The boys are instructed in all the practical arts of boys was—gardening, the use of carpenters' and joiners' tools, baking and mat making; for the girls, the usual needle-work, washing, ironing, cooking, and the common household employments, under the direction of the mistress. The master and instruction of the boys in the work-shop has been hitherto of a limited kind; but the garden presented very satisfactory evidences of their skill and industry. It is cultivated in common, with the exception of small plots about twelve feet square, which belong to the boys, and of the produce of which they keep a debtor and creditor account. The produce of the rest is sold to persons who take it off to market, and the proceeds are carried to the general account of the establishment. The crops were abundant, and more varied than it is usual to see in common gardens. Something was found to fill up every space, and to suit every spot—either one of the ordinary garden crops, or some of the useful herbs, or some kind of plant or flower; and thus a lesson of considerable use to a cottager is early communicated, in the habit of making the best of even the smallest portion of ground, however apparently unpromising. The practical instruction, and the valuable example, of which the pupils here have the benefit in their garden-work, will be greatly extended when the agricultural operations in the village are brought to the establishment. They will then enjoy the further advantage of pursuing all the details of the most skilful husbandry, under the same good guidance, namely that of the benevolent founder of this establishment, The Rev. Wm. Rham, which is well known as an accomplished agriculturalist. The school will, indeed, from that period be able to offer to the children of the agricultural labourer a course of practical training in garden and farm management of no ordinary excellence.' But it is as a scientific agriculturist that Mr. Rham's name is most widely known; and, until recently, it was perhaps better known in other countries than in England. His early connection with the Continent, which was kept up in after-life, afforded scope for observation of the husbandry of different countries; and his thorough knowledge of several living languages gave him access to the works of scientific writers on foreign agriculture. In the next place, his chemical studies at Edinburgh, while preparing for the medical profession, were of eminent service to him; and scarcely less so was the proficiency in mathematics which he acquired at Cambridge. It may safely be asserted that no other writer on agriculture ever enjoyed in so great a degree such a combination of advantages; and to his knowledge of the chemical and mechanical details of agricultural pursuits, may be attributed, through acquaintance with its routine details. We would simply refer to the article Plow, P. C., as an example of this combination of science with practical knowledge. On the application of chemical knowledge to agricultural matters, he had a practical perception of its details, and a scientific knowledge of its processes, which has probably never before been possessed by one person. Thus, above all other writers
from the poles of the battery, or rheometer, proceed the two conducting wires to the rheometer, one directly, and the other through the intervention of a slender brass-wire wound. The circuit is completed in numerous ways, but the arrangement of David and the other of brass, each about 1/4 inch diameter. On the former the wire is coiled in spiral grooves, like those of a screw, so that the several coils are isolated from one another; and the brass cylinder, with a hand wheel for turning it on its axis, in order to permit more or less of the wire on the wooden cylinder to be uncoiled from it and ground with the object, so that the quantity of wire, forming part of the circuit, may remain on that cylinder; this apparatus is called a rheostat.

In employing the instrument, an object whose resistance to the passage of the electric, galvanic, or magnetic fluid is to be ascertained, is placed so as to form part of the circuit, and the point at which the needle in the rheometer stands is to be observed; then, removing the object, and turning the cylinders till such a quantity of wire is coiled on the wooden cylinder as will bring the needle to the same point, that quantity of wire, which can be measured by a scale on the instrument, will serve to indicate the resistance caused by the presence of the object which had been interrupted, or, in voluting, electrifying; f.e., it is necessary to maintain a constant degree of energy in the current.

RHINACANTHUS (from *μον, a mont, and *δεσδος, a thorn), a genus of plants belonging to the natural order Acanthaceae. It has a regularly 6-parted calyx with small subulate bracts and bracteoles: a hypogynous capsule, with a long slender tube, the upper lip narrow, the lower trifid, with equal segments; 2 staminodes inserted in the throat of the corolla, the anthers 2-celled, awnless, with 1 cell placed above the other almost in a line; a clavate capsule much compressed at the base, with the commissure of the valves in contact and sessile; the upper part 4-seeded, or by abortion 2-seeded; the dissepiment complete, adnate; the seeds small, testarv, globular, augmented with hooks which are concave and obtuse.

R. communis is a native of the continent of India, with opposite stalked broad-lanceolate obtuse leaves, above smooth, below a little downy, often from 2 to 4 inches long and from 1 to 2 broad, and a flabby ring surrounding the base of the ovary. The roots of this plant are boiled in milk, and are reckoned by the natives of India an aphrodisiac. In conjunction with this, pepper and pepper they are used as an external application for ringworm.

R. major has linear-lanceolate serrate leaves; the flowers in racemes, are ovoid in the upper part of the corolla lobes, the bracts inciso serrate, with an attenuated point, the seeds with a very narrow membranous border. This is the plant of British botanists, but R. major is the small hamelot of the flower-gardeners. Its flowers margin to the seed, and the central part of the upper lip of the corolla as prominent as the lateral lobes. This plant is found in meadows and corn-fields in the North of England, but is West Country in its distribution.

Several other species of this genus have been described. Koch, in his ‘Flora Germanica,’ has five, — R. minor, the rirrita gali above described, R. major, R. dectororopus, R. angustus, and R. alpinus.

(Don, Gardener’s Dictionary; Babington, Manual of British Botany.)

RHYZODUS, a genus of fossil fishes from the carboniferous limestone of Scotland. (Owen.)

RHYNCOSPORA, a genus of plants belonging to the natural order Cypariceae. It has few-flowered spikelets, 0 or 7-flowered, the latter being found in the nut compressed, convex on both sides, crowned with the dilated base of the style. There are two British species: R. abeta, not uncommon on turf and bogs, and R. fuscum, a rare species from the coast of Devon in Ireland. (Babington, Manual of British Botany.)

RIBALTA, FRANCISCO, a distinguished Spanish painter of the school of Valencia, was born at Castellon de la Plana in 1551. When very young he fell in love with his master’s daughter, but the father (his name is not mentioned) would not consent to a marriage, on the plea that Ribalda was not sufficiently advanced in his profession. Upon this he determined to go to Rome, and his mistress pitied her faith to him. At Rome he studied the works of Raphael, and particularly Sebastián del Piombo, and, according to Cen Bermúdez, those of the Carracci also, but this is an error; none of them went to Rome before 1600, some years therefore after Ribalda must have left it.

Upon his return to Valencia after an absence of three or four years he immediately repaired to the house of his master, who was absent; but upon an ease in his study was standing an unfinished sketch, which the young painter as rapidly as possible completed in the presence of his still faithful mistress, and immediately retired. The father was much surprised at what he saw, and asked his daughter who had been there, at the same time observing, ‘If this were your lover, willingly should you marry him, but not the poor Ribalda.’ ‘Ribalda himself has done it,’ said his daughter, and of course the marriage took place.

Ribalda soon obtained great reputation. His first public work was the Last Supper, ordered by archbishop Don Juan de Moncada, governor of the town of the college of Corpus Christi, at Valencia. He was rewarded with the merit of a large part of the place Pedro Muñoz as St. Andrew; and as Judas, a shoemaker of the name of Prada, whose vicinity was a nuisance to him. He died in 1628, and was buried in the church of San Juan del Mercado, in Valencia.

Ribalda’s design was correct and vigorous; he was a good anatmist; and his compositions are often grand. In colouring also he was generally good, much resembling Sebastián and Titian, though occasionally dry; but the works of some of his principal scholars, as Castañel and Baus, are sometimes attributed to him. His works are or were very numerous in Valencia, and in the church of the Convent of San Luis, Castellon de la Plana, and Madrid; and some at San Ildelfonso, Toledo, Zaragona, Andilla, Algemena, Torrente, Portaceli, Morella, and Carcañate.

The Entombment by Ribalda, in the cathedral of Valencia, is an excellent work, and there are also many admirable pictures by him in private collections in Valencia, as the Conde de Parement, and the Mazques del Raful. The Convent of Santa Clara has the very beautiful Castellon de la Plana, and Madrid; and some at San Ildelfonso, Toledo, Zaragona, Andilla, Algemena, Torrente, Portaceli, Morella, and Carcañate.

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Philanthrope.' He was best known however for a series of Essays on the principal Characters of Shakspere, which appeared in three successive volumes beginning in 1776, and were in 1797 collected into one volume, which became very popular and has been reprinted several times. Those essays show considerable critical talent, and some eloquence in writing: their chief fault is the depreciatory spirit in which they treat the great poet, and which has exposed them to severe censure from Mr. Knight and some other recent critics.

RICKMAN, THOMAS, a distinguished writer on Gothic and other works has become a standard authority in this country, and in whose work there is something remarkable: for though neither his education nor his first pursuits in life were calculated to direct his attention to the study of architecture, while the religious tenets in which he was brought up by his parents (those of the Society of Friends) were ill fitted to inspire a taste for that particular branch of the art which he especially cultivated, he not only made it his study, but when he had reached the meridian of life, took up architecture as his profession, and obtained extensive practice.

He was born at Maidenden June 8th, 1776, and brought up by his father, who was a surgeon and apothecary in that town, to the same profession. He went in 1797 to London, where he became for a while assistant, first to Mr. Stringer, chemist to the royal family, and next to Mr. Atkinson, in Jersey Street. On quitting the chemical, he changed his situation only but his vocation also, and entered into the employment of Messrs. Day and Green, extensive grocers, at Saffron Walden. His residence at Saffron Walden was not happy, his persistence being cause of frequent and heavy bills which his father, who was anxious that he should complete his medical education, he went again to London, and 'walked the hospitals' after which he returned, in 1801, to his father who was then settled at Lewes, but did not remain with him above two years, when he repaired again to the metropolis, and engaged himself as clerk to a corn-factor,—a step likely to lead him farther from than bring him at all near his professional destination. Nevertheless it proved a stepping-stone to him, so far that he became a partner in the business. In 1808, about the time of the death of his first wife (his cousin Lucy Rickman, to whom he had not been married above a year), he removed to Liverpool, where he made another change, for he took a situation in the counting-house of one of the principal insurance-brokers there. Uncongenial and unsparing as it apparently was in itself, this new situation proved the making of his fortune and fame; for as the attention to business it required occupied him only a few hours in the day, he devoted his leisure to the study of architecture. But here there is evidently a gap in this most interesting and exciting phase of his career, for we are left altogether in uncertainty as to the influence or impulse which directed him to a pursuit so remote from his habits and employments.

However, having once taken up the study he pursued it zealously; examined ancient buildings with diligence—in a word, educated himself; and perhaps saw all the clearer because he was not trained in his inquiries by the prejudices and conventionalities of a professional education. He was also industrious with his pencil, and carefully noted all those distinctions in the different modes of the pointed style on which he founded his valuable system of classification for it. About this period he married his second wife, Christiana Horner, sister to Thomas Horner, the artist who painted the large panorama of London, in the 'Colosseum,' in the Regent's Park.

On the grant of a million for additional churches being made by Parliament, Rickman, who had previously made attempts at original design, became a competitor, and a determined one in the contest. He was determined to establish himself as an architect; he quitte Liverpool and removed to Birmingham, as being in his opinion a likelier situation for obtaining practice from various quarters. Having no practical experience of that time himself, and being unacquainted with the business routine of the profession, he engaged Mr. Henry Hutchison as his managing assistant in all matters of business, and after his death (1830) entered into partnership with Mr. Hussey.

In 1835 he married his third wife, Elizabeth Miller, of Edinburgh, by whom he had a son, and who survived him. Some years previous to his decease he had had an apoplectic attack, but his naturally strong constitution prevailed against its effects, and he continued to exercise his profession up to the time of his death, which happened March 4th, 1841.

Had Rickman been known only as a writer, his ' Attempt to discriminate the Styles of Architecture in England' (originally written for the Transactions of the Society of Science and Art, but greatly extended as a separate work, and improved in each fresh edition), it would have obtained for him celebrity, for it has become a standard book, and is almost indispensable to the student. Nevertheless it is omitted among those on the subject of Gothic architecture, of which a list is given in Gwilt's Encyclopedia. The work itself, however, recommended him to all classes of architecture, opened the road to extensive practice, and procured him patronage in very innumerable quarters, where as a sertician he could hardly look for direct countenance and employment. It is to be observed however that 'latterly'—by which it is no doubt is to be understood when his profession brought him into contact with the clergy—he withdrew from the Society of Friends. In all probability he had already done so when he was employed at Cambridge and at Rose Castle, the palace of the Bishop of Carlisle, which was restored by him.

At Cambridge he executed the new court and buildings (begun in 1827) of St. John's College. Perhaps hardly any individual in the profession was ever employed upon so many churches as Rickman, and a list of them and of other buildings by him is given in the 4th edition of his book; but, long as it is, that list is incomplete, because it does not come down later than 1835. It also be to be remembered that it is a mere list, without so much as any dates. This is it is to be hoped will still be done, and the list itself completed in the next edition of the work, which we understand has been long in preparation. Notwithstanding this a full memoir of Rickman will then be given; and one very desirable improvement it would be were a descriptive catalogue of his buildings to be illustrated by wood-cuts of them— if not of all, of the best. Such a catalogue would be useful for the student which pass over the pulleys or the axes of the wheels; and, in order to understand how this condition affects the relation between the moving power and the resistance, let it be observed that when a stiff rope is bent over the upper part of a wheel or pulley in a vertical plane, for example, the weights or powers applied at its extremities may not be sufficient to draw the descending portions into the positions of two vertical lines. Now, if one of the parts of the rope should take such a direction that a vertical line drawn through the weight attached to that part, cuts the horizontal diameter of the wheel or pulley at a point between the centre and one extremity of the circumference, for we are speaking of a curve represented by r and z respectively, the corresponding weights by W and W' and the radius of the wheel by R; the conditions of equilibrium instead of being W = W' will be

\[ W \left( R - z \right) = W' \left( R + z' \right) \]

But, if W be the weight by which descending mixes up the other, the value of z is generally so small that it may be disregarded, so that we have, in the case of equilibrium,

\[ W = W' \left( R + z' \right) \text{ or } (W - W') = W' z' \]

or again, 

\[ W' = \frac{W - \left( W + W' \right) z'}{R} \]

that is, in order to put the system in a state of equilibrium, the excess of W above W' should be equal to $W' z'$.

The formula given by Coulomb to express the forces necessary for overcoming the rigidity of a rope, or the equivalent of $W' z'$ is

\[ \frac{W}{R} \left( \frac{a+bW}{a+b} \right) \]

r being the semi-diameter of the rope, a the force arising from the warping or twisting of the rope, and b that which depends on the tension arising from the weight W; the values of a and b may be determined by experiments made under...
with cords of different diameters; and thus \( \pi \) may be found. M. Coulomb ascertained that for slender string, \( \pi = 1 \), and that for stiff cordage the value of \( \pi \) varied from 1 to 2; also, from some experiments made with ropes consisting of 20 strands of hemp, he determined that the weights requisite to overcome the rigidity, when the ropes passed over a pulley four inches in diameter, and were strained by weights equal to 25 lbs., 125 lbs., and 425 lbs., were 5 lbs., 25 lbs., and 125 lbs., respectively.

Unfortunately, ropes of equal dimensions differ much in rigidity, so that little dependence can be placed on the results of general formulæ in estimating its value. While ropes which are dry and those which are dry and the rigidity of ropes is greatly increased by tarring them. In general the weights necessary to overcome the resistance of tared ropes is proportional to the number of the threads of which they are composed.

RINCON, ANTONIO DEL, court painter to Ferdi-

nand and Isabella, and the first good Spanish painter, was born in Guadix in the middle of the fifteenth century, or probably as early as 1446. From the largeness of his style compared with the generally then prevailing Gothic design, not only in Spain but in the greater part of Italy, he is supposed to have studied in Florence, and probably with Andrea del Castagno, or with Simone degli Spigoli. Most of Rincon's works have already perished, but there is still an altar-piece, consisting of seventeen pictures from the life of the Virgin by him painted, now in the church of Santiago, in Madrid to Avila, the Escorial, which display many excellent qualities of art. In 1483 he executed some works in the old sacristy of the cathedral of Toledo; he was employed by Ferdinand for the construction of the Escorial and the churches of Spain, but both pictures and palaces have long since perished by fire, and otherwise. Rincon was decorated with the order of Santiago; he died at Seville in 1500. Antonio's son, Fernando del Rincon, was a good fresco painter.

(Coon Bermudes, Dicionario Histórico, &c.)

RIZI, DON FRANCISCO, a distinguished Spanish painter, was born at Madrid in 1608. He was the pupil of Vincenzo Cardano, and had the extraordinary reputation of invention and execution, but was at the same time, as is usual in such cases, superficial and incorrect: still his readiness to design and facility to execute ensured him a brilliant career. It was not till 1666, however, that he was appointed principal painter to Philip IV.; and he held the same place under Charles II., who gave him the additional place of deputy keeper of the royal keys. He was appointed in 1658 painter to the cathedral of Toledo, a post often in Spain more important than that of painter to the king, for he has the charge of all existing works in the cathedral, and generally the execution of all new works undertaken in his time, which in Spain is a matter of property and habitation, and so much the more important. Francisco Rizi is, however, one of those painters to whom the decline of painting in Spain is attributed, through the mere superficial attractions of his works; and he is said also to have done great injury to the taste of the period. It is said that Rizi's last work was a sketch for the great altar-piece of the Retablo de La Santa Forma in the Sacristy of the Escorial, which Charles II. ordered for the veil of the magnificent tabernacle and altar, which Rizi also had assisted in making, to contain the Host (La Santa Forma). The subject was the ceremony of the Collocation of the Host by Charles II. in 1684; but Rizi died the following year at the Escorial, having only executed the sketch; the picture was painted by Coello from a sketch of his own, and it is one of the finest pictures in Spain. [Coxe, CLAUD, F. C. S.]

The Retablo de la Santa Forma Incorrupta is the miraculous wafer which bled at Gorkum in 1525 when trampled on by the followers of Zwingli. Rudolf II., Emperor of Germany, gave it to Philip II. of Spain, whither it was transported in 1592. It has the present gorgeous altar and tabernacle for its reception, and the present altar-piece is the ceremony of its collocation. The altar is inscribed—En magni operis miraculis, in mini mirabilis Dei. It is supposed that he is the original from which the forms are exhibited for adoration, the picture, which forms a veil, is let down, and is accordingly much injured. The French, under La Houssaye, who pilfered the Escorial in 1808, carried off silver covers to adorn the tabernacle; the monks hid the wafer in a cellar, and it was restored with great pomp by Ferdinand VII. in 1814.

The pictures, both frescos and in oil by Rizi, are very num-

merous; there are several in the Museo of the Prado at Madrid, and many in the churches of Madrid and Toledo, especially in the cathedral of Toledo. Fray Juan Rizi, Francisco's elder brother, born at Madrid in 1556, was also an eminent painter and in the Benedictine monastery of San Martin at Madrid. His design was more correct than his brother's, and his pictures are distinguished for force of light and shade. He retired to Rome and joined the Benedictines of St. Pius V.'s. He was made an archbishop, in 1675, by the pope Clement X., but he died in the same year at Monte Cassino before entering upon the duties of his office.

(Coon Bermudes, Dicionario Histórico, &c.; Ford, Guide for Travellers in Spain, &c.)

ROADS. In Scotland the public highways used for purposes of general transit throughout the country, and suited for the use of vehicles, are under three separate kinds of management. The country in general, with the exception of some Highland districts, is penetrated by turnpike-roads managed by district trusts in terms of local statutes. These are interpreted along with the Act 1 & 2 Wm. IV. c. 49, for the general regulation of turnpike-roads. According to returns of the rents of the various bars, the smallness of the sum at which bars are occasionally farmed is conspicuous. Thirty-six bars bear to have been let for sums not exceeding 20l. each, and the number let at sums between 20l. and 100l. is 338. [Local and Revenue, 1844, p. 93.] It is obvious that in such a system the rent of the bars, which is the sum available for expenditure on the roads, must be very small in proportion to the expenses of the road-lessee who pays 10l. or 20l. a year must collect an additional sum sufficient for his own support. The highways throughout the country, which are neither turnpikes nor part of the system to be presently noticed, are called 'commutation roads.' The management of these roads is settled by local Acts referring to the several counties. From various reports made to parliament, it appears that the counties are divided into small districts, generally corresponding with the parochial division, and that the sums collected throughout the counties are distributed among these districts, and subjected to management and disbursement by petty local boards, more apt to consider the convenience of the roads in reference to their own profit by selling the tolls than to do any good to the public. A third system of roads is under commissioners appointed in terms of statute (59 Geo. III. c. 135), called the Commissioners of Highland Roads and Bridges. One fourth of the expenses of these roads are paid annually by the exchequer, and the other three-fourths are assessed on the proprietors of land in the several Highland counties. The commissioners make an annual report to parliament. By the 4 Geo. IV. c. 56, provision was made for the lapsed proprietors and the commissioners of supply of any of the counties, agreeing to relieve the parliamentary commissioners of the burden of any of these Highland roads, and supporting them by the produce of tolls.

The law as to footpaths and other roads which do not belong to any of the above three systems, is not in a very clear state in Scotland. The right of transit in such cases is founded on the Roman system of 'viridarium,' under which where the public enjoy it, it generally rests on the title of the occupant of some districts of land having a right of pathway through some adjoining place. Sometimes the right is of a purely private character, and confined to the proprietor or tenant of some tenement. At other times it is in the possession of a community, as a village or parish; and in such case it is not lawful to stop any person who may use the path, on the assumption that it is the property of the public. Such paths are virtually public; but there is no such principle applicable to them as that which stamps the publicity of a highway in England by rendering the public liable to repair it.

ROASTING is that culinary process by which meat is brought from a raw to a cooked state more directly by the action of fire than by any other means except that of broiling.
By the latter, the heat is applied immediately and suddenly to the surface, by which it is hardened, so that the juices of the meat are entirely retained, evaporation being thereby prevented; while by the former the heat is applied gradually, the watery portion is evaporated, as well as the fat melted out to a considerable extent, till the progressive browning and hardening of the surface prevent the escape of the juices. The loss of weight in roasting meat is much greater than by boiling: by this latter process, mutton loses one-fifth, and beef one-fourth, but by roasting, these losses are about one-third of the initial weight; the loss arises from the melting out of the fat, and the evaporation of the water; but the nutritious matter remains condensed in the cooked solid. Thus, while in boiling, largely partly destroyed. Roasted are therefore more nutritious than boiled meats.

(Paris On Diet.) The digestibility is also increased, especially in young meats, which are deficient in osmosis, to which the sapidity is mainly owing, and which during boiling passes into the water employed, while in roasting it is powerfully developed and almost entirely retained. Young and viscid food, therefore, such as veal, chickens, &c., are more wholesome when roasted than when boiled, and are more easily digested. The best and most tender meat may, however, be rendered hard and indigestible by a careless or ignorant cook. Everybody knows the advantage of slow boiling—slowly and leisurely)—as stated by Dr. Cuthbertson,

Cook’s Oracle, in which the most sensible and racy instructions on this head are given.

The digestibility is increased by the meat being well done, roasted or boiled; for though the latter state is not contain most nutriment, yet it will be less digestible on account of the density of its texture. This is of importance to remember when it is intended for the diet of convalescents, for what the above best meats are served.

ROOTAN, or Rattan, is an island in the Caribbean Sea, opposite the coast of Honduras, one of the states of Central America. It lies between 10° 5' and 10° 10' N. lat., and between 86° 5' and 86° 3' W. long., and is about 700 miles from Margarita, north-east to west-south-west about twenty miles, or some- what more; the width in no part exceeds five miles, which is about its breadth for the greater part of its extent. The area hardly exceeds 60 square miles. This island is one mass of rocks, but covered with a deep soil, which, united to a moist and warm climate, produces an unusual abundance of vegetation. It is overgrown with high trees, except at the western end, where there are some savannahs, on which formerly mules and other cattle were raised. The highest part of the rock is 800 feet above the sea-level. The woods abound in deer, wild hogs, geese, cattle, pigeons, parrots, and other birds, many of which afford excellent food. The whole coast swarms with fish and turtle. On the southern shores are three small harbours, Port Royal, Dixon’s Cove, and Cosan’s Cove. This island was discovered by Columbus on his fourth voyage, in 1502, and was formed a settlement in 1509, when they had numerous settlements on the Mosquito shore, but it was abandoned in 1785, when the English withdrew their garrisons from the Mosquito Shore. In 1784, when the Colonists of the Island of St. Vincent, several islanders of the English and were compelled to submit, nearly all the prisoners with their families were transported to Roatan. But they soon abandoned the island, and passed over to the continent of America, where they settled near Trujillo, in which town their descendants still form the bulk of the population. When Orlando Roberts visited Roatan (1822), it was uninhabited. But it appears that more recently some families have again settled there, under the protection of the government of Belize, especially for the purpose of fishing and taking turtles. (Henderson, Account of the British Settlement of Honduras, &c.; Orlando Roberts, Narrative of Voyages and Explorations on the East Coast and in the Interior of Central America.)

ROEBUCK, JOHN, M.D., the son of a Sheffield manufacturer, born in 1718, received a liberal education at Northampton under Dr. Doddridge. On entering on the Medical, Roebuck, an extensive refinery and chemical manufacturer at Birmingham. He there effected such improvements in the manufacture of sugar, that of course (formerly called vitriolic acid, or oil of vitriol), by the use of his patents, and by other modifications of the process, as enabled him to reduce its price from sixteen-pence to four-pence 19 lb., and thus to render it available for many new and important purposes. In 1774, he married Jane, daughter of Mr. Ford, of Worthington, with whom he was acquainted in his early days.

The inventor, to thank the many friends who have contributed to his success, in 1766, established a works at Carron (Carron, P. C., p. 519), for the purpose of bringing these improvements into practice, thereby rendering a great service to our domestic sugar manufacture. Abandoning the chemical practice, Roebuck henceforward resided chiefly in Scotland, where he perfected improved methods of smelting and manufacturing iron with pit-coal instead of charcoal, and in 1780, he erected a large works at Carron, for the purpose of bringing these improvements into practice. The furnace which he constructed in Carron was the first furnace in Great Britain, and the first furnace which was established in the history of British manufactures, was blown on the 1st of January, 1760. Fortunately for himself, Roebuck subsequently became the lessee of extensive coal and salt-works at Borrowstounness, belonging to the Duke of Hamilton. For the carrying on of these works, on which he employed nearly a thousand persons, he was obliged to withdraw his capital successively from his other undertakings, and he never afterwards returned to his chemical practice, to the great loss of science, and to the very serious loss of his clients. He was the author of the modern steam-engine, in the first patent for which he had a share. He died on the 17th of July, 1794. In a copious memoir in the fourth volume of the Transactions of the Royal Society of Edinburgh, his life and work is narrated. Many of his chemical works, especially the author of the modern steam-engine, in the first patent for which he had a share. He died on the 17th of July, 1794. In a copious memoir in the fourth volume of the Transactions of the Royal Society of Edinburgh, his life and work is narrated. Many of his chemical works, especially the author of the modern steam-engine, in the first patent for which he had a share. He died on the 17th of July, 1794. 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of pictures in Seville [POCHECO, P. C. S.], reproached Roelas with want of decorum in a picture, in the Merced Calzada, of St. Anne teaching the Virgin to read, for representing some sweaters and a woman in the picture. He might have been excusable for not being able to read the picture; and also for painting a sheet, intended to wrap the infant Saviour in, who is naked, in the picture of the Nativity, in the chapel of the university.

Moreover, the second picture of the series by Carracci; he is the best of the Andalucian painters in design and composition, and displays frequently a grandeur of form and majesty of character which belong only to the greatest masters: in contrast, Roelas, in view of his success, has a very weak picture of the last picture is apparently the Nativity, at Olaviers. Palamos’s account of his painter is almost wholly incorrect; he calls him Doctor Pablo de las Roelas.

(On the History of Art, p. 123.)

ROEMERIA (named after Dr. John James Römer, professor of botany at Landshut; he was author of several botanical works, and died in 1830), a genus of plants belonging to the natural order Papaveraceae. It has 4 petals, numerous stamens, 2-4 sepaline stigmas, an elongated 2-4-valved 1-celled capsule with distinct placenta. The species are annual herbs yielding a yellow juice, with violet flowers.

R. hybrida, Hybrid Roemera, has a 3-valved erect pod with a few rigid leaves at its extremity. This plant is a native of Europe and the north of Africa, in cultivated fields and vineyards, especially on the coasts of the Mediterranean. It may be found in England, as it is frequent in Cambridgeshire and Norfolk. Although now having the appearance of a native, this plant has been probably introduced into this country. Two other species, R. refracta and R. roemera, have been described, the first a native of Tauria, the second of Syria.

(Den, Gardener’s Dictionary; Babington, Manual of British Trees, p. 37.)

ROMAN ARCHITECTURE. [CIVIL ARCHITECTURE, P. C.]

ROMAN CATHOLICS AND JEWS. An act was passed on the 18th August, 1846, 9 & 10 Vict. c. 59, intituled ‘An Act to regulate Her Majesty’s Suffering from Penalties and Disabilities in regard to Religious Opinions.’ This act repeals the statutes or ordinances and the several acts, statutes or ordinances as far as such parts of any of the said acts as are herein after specified, that is to say—The statute or ordnance of the fifty-fourth and fifty-fifth years of the reign of King Henry III., and the statute or ordnance commonly called Statutum de Judaismo. The effect of the repeal of these statutes may be understood by referring to the article Jews, P. C. The Statutum de Judaismo was made in the third year of Edward I. It was a law of the Realm, or any domain therein or country by virtue of the power, dominion, or obesiance of his highness, that it may be used as a form of punishment, or any other thing to extinguish anything of the extinguishing, advancement, setting forth, maintenance, or defence of any such pretended or usurped jurisdiction, power, dominion, or any part thereof, or to abet, aid, procure, or counsel any person so offending; provided always, and be it declared, that nothing in this enactment contained shall authorize or render it lawful, or permit any person to stand, set forth, maintain, or defend any such power, pre-eminence, jurisdiction, or authority; nor shall the same extend farther than to the repeal of the particular penalties and punishments therein referred to, but in all other respects the law shall continue the same as if this enactment had not been made: provided further, that if any such person in holy orders according to the rites and ceremonies of the United Church of England and Ireland shall stand, set forth, maintain, or defend any such power, pre-eminence, jurisdiction, or authority, such person shall be incapable of holding any ecclesiastical promotion, and, if in possession of any form of canonical dignity, be deposed thereof by due course of law, in the same manner as for any other cause of deprivation. Also so much of another act passed in the first year of the same reign’s reign, 9 & 10 Vict. c. 1, intituled Uniformity of Common Prayer and Service in the Church, and Administration of the Sacraments, and of another act of the parliament of Ireland passed in the second year of the same reign’s reign, 9 & 10 Vict. c. 1, intituled Uniformity of Common Prayer and Service in the Church, and the Administration of the Sacraments, as relates to a person’s residing to his parish church or chapel accustomed, or, upon reasonable let thereof, to some usual place where
common prayer and such service of God as in such acts are mentioned are used in such time of let, upon Sundays and other days ordained and used to be kept as holy days, and to be observed with special devotion and prayer, according to the use and practice of the common prayer, preaching, or other service of God there used and ministered: [The penalties from which persons are hereby relieved will appear by referring to Law, Crim. P. C. S., p. 179.]

Also an act passed in the fifth year of the same queen's reign (5 Eliz. c. 1), intituled 'An Act for the Assurance of the Queen's Royal Power over all Estates and Subjects within England: [Law, Crim. P. C. S., p. 178.]

Also an act passed in the thirteenth year of the same queen's reign (13 Eliz. c. 2), intituled 'An Act against the bringing in and putting in execution of Bulls, Writings, or Injunctions, and other superstitious Things from the See of Rome,' so far only as the same imposes the penalties or punishments therein mentioned; but it is hereby declared that nothing in this enactment contained shall authorize or render it lawful for any person or persons to import, bring in, or put in execution within this realm any such bulls, writings, or instructions, and that in all respects, save as to the said penalties or punishments, the law shall continue the same as if this enactment had not been made.

Also an act passed in the twenty-ninth year of the same queen's reign (29 Eliz. c. 6), intituled 'An Act for the more speedy and due Execution of certain Branches of the Statute made in the twenty-first year of the reign of Queen Elizabeth, and for the more speedy and due Execution of the Statute of the said Queen's Majesty, intituled 'An Act to retain the Queen's Majesty's Subjects in their due Obedience.' [Law, Crim. P. C. S., p. 179.]

Also an act passed in the first year of the reign of King James the First (1 Jac. I. c. 4), intituled 'An Act for the due Execution of the Statutes against Jesuits, Seminary Priests, Recusants, &c.' [Parent and Child, P. C.]

Also so much of an act passed in the third year of the reign of the said King James the First (3 Jac. I. c. 1, § 2 in part), intituled 'An Act for a public Thanksgiving to Almighty God every Year on the Fifth Day of November,' as enacts 'that all and every person and persons inhabiting this realm of England and the dominions of the same shall always upon that day devoutly and faithfully resort to the parish church or chapel accustomed, or to some usual church or chapel where the said morning prayer, preaching, or other service of God shall be used, and then and there to abide orderly and soberly during the time of the said prayers, preaching, or other service of God there to be used and ministered.'

Also an act passed in the said third year of the said King James's reign (3 Jac. I. c. 4), intituled 'An act for the better discovering and repressing of Popish Reconciliations.' [Law, Crim. P. C. S., p. 179.]

Also an act passed in the seventh year of the same king's reign (7 Jac. I. c. 6), intituled 'An Act for administering the Oath of Allegiance, and Reformation of married Women Reconciliations.'

Also so much of an act passed in the thirteenth and fourteenth years of the reign of King Charles the Second (13 & Car. II. c. 4, § 11), intituled 'An Act for the Uniformity of the Publick Prayers and Administration of Sacraments, and other Rites and Ceremonies, and for establishing the Form of making, ordaining, and consecrating Bishops, Priests, and Deacons in the Church of England,' as makes any schoolmaster or other person instructing or teaching youth in any private house or family as a tutor or schoolmaster punishable for instructing or teaching any youth as a tutor or schoolmaster before licence obtained from his respective archbishop, bishop, or ordinary of the diocese, according to the law and statutes of this realm, and before such subscription and acknowledgment made as in the said act is mentioned.

Also so much of the last-mentioned act whereby any act or prayers be not reformed before required or confirmed to be a force. [Law, Crim. P. C. S., p. 179.] This statute against teaching in a private house or family has long since fallen into disuse, but the formal repeal of it is an admission of the right of such teaching, which is still attended with the same threats of interference from the Church [Constitutions and Canon, Ecclesiastical, P. C. S.], which goes further than the statute of Charle., II., but this can be safely neglected by any teacher to be taught by any person in 'private house.' The canon forbids only men from teaching without licence or subscription. At that time of day women probably did not teach.

And also so much of any act or acts of parliament whereby the said parts of the said act of the thirteenth and fourteenth years of the reign of King Charles the Second herein-before repealed have been confirmed or incorporated in any other act or acts of parliament, as the same are not in any wise to be considered during the said times as parts of any of the common prayer, preaching, or other service of God there used and ministered: [The penalties from which persons are hereby relieved will appear by referring to Law, Crim. P. C. S., p. 179.]

Also so much of an act of the parliament of Ireland passed in the seventeenth and eighteenth years of the reign of the said King Charles (17 & 18 Car. II. c. 6, § 1, [1]), as requires any such persons as tutors or schoolmasters to take the oath of allegiance and supremacy, and makes such schoolmasters or other persons punishable for so instructing or teaching youth in private houses obtained from their respective archbishop, bishop, or ordinary of the diocese, and before such subscription and acknowledgment made as in the said act is mentioned.

Also so much of an act passed in the thirtieth year of the reign of the said King Charles (30 Car. II. st. 2, § 5 in part), intituled 'An Act for the more effectual preserving the King's Person and Government by disabling Papists from sitting in either House of Parliament,' as enacts that 'every person now or hereafter convicted of Popish recusancy who hereafter shall, at any time after the said first day of December, come advisedly into or remain in the presence of the king's majesty or queen's majesty, or shall come into the court or house where they or any of them reside, as well during the reign of his present majesty (whose life God long preserve) as during the reigns of any of his royal successors, kings or queens of England, so shall be liable to such penalties and forfeitures, and disabilities in this act mentioned or contained.'

Also so much of an act of the parliament of Scotland passed in the eighth and ninth year of the first reign of King William and King Mary (8 & 9 W. III. c. 3, § 8), intituled 'An Act for preventing the growth of Popery,' and all laws, statutes, and acts of parliament revived, ratified, and perpetually confirmed by the said act of King William's first parliament, except as to the form of the formula in such last-mentioned act contained.

Also so much of an act passed in the eleventh and twelfth years of the reign of the said King William the Third (11 & 12 W. III. c. 4), intituled 'An Act for further preventing the growth of Popery.' [Law, Crim. P. C. S., p. 178; Parent and Child, P. C.]

Also so much of an act passed in the first year of the reign of Queen Anne (1 Anne, st. 1, c. 30), intituled 'An Act to oblige Jews to maintain and provide for their Protestant children:

'This statute empowered the Lord Chancellor, on complaint being made to him, to order a Jewish parent to allow his Protestant children a maintenance suitable to the fortune of the parent. [Parent and Child, P. C.]

Also so much of an act of the parliament of Ireland passed in the second and third years of the reign of King George the Second (2 Geo. II. c. 17), intituled 'An
Act for securing the Estates of Papists conforming to the Protestant Religion against Disabilities created by several Acts of Parliament relating to Papists; and for rendering more effectual the several Acts of Parliament made for Inventing in the two Universities of Dublin and Oxford, the Presentation of Benefices belonging to Papists, except so much of the said act as relates to any adswonon, or right of presentation, collation, nomination, or donation of or to any benefice, prebend, deanery, or other church, hospital, collegiate, or collegiate, or any gift or grant or avoidance thereof, or any admission, institution, or induction to be made thereupon, but so as that the repeal of the said act shall not in anywise affect or prejudice the rights and liberties of the inhabitants of the said two universities, tenants, tenements, or hereditaments under and by virtue of the provisions of the said act at the time of such repeal.

Also so much of an act of the parliament of Ireland passed in the seventeenth and eighteenth years of the reign of King George the Third (17 & 18 Geo. III. c. 49, s. 1[1]), intituled "An Act for the Relief of His Majesty's Subjects of this Kingdom denominating the Popish Religion," as entails that no maintenance or portion shall be granted to any child of a Popish parent, upon a bill filed against such parent pursuant to the aforesaid act of the second of Queen Anne, out of the personal property of such Papists, except out of such leases which they hereinafter take under the powers granted in this act.

Also so much of an act passed in the eighteenth year of the reign of King George the Third (5 Geo. II. c. 60, s. 5), intituled "An Act for relieving His Majesty's Subjects professing the Popish Religion from certain Penalties and Disabilities imposed on them by an Act made in the eleventh year of the reign of the said King," and also of the Third, intituled "An Act for the further preventing the Growth of Popery," as entails that nothing in this act contained shall extend or be construed to extend to any Popish bishop, priest, Jesuit, or schoolmaster who shall not have taken and subscribed the above oath in the above words before he shall have been apprehended, or any prosecution commenced against him.

Also so much of an act of the parliament of Ireland passed in the twenty-third and twenty-fourth years of the reign of the said King George the Third (23 & 24 Geo. III. c. 58 [1]), intituled "An Act for extending the Provisions of an Act passed in this Kingdom in the nineteenth and twentieth Years of His Majesty's Reign, intituled "An Act for naturalizing such foreign Merchants, Traders, Artificers, Artists, Manufacturers, Workmen, Seamen, Farmers, and others, as shall settle in this Kingdom," as entails that out of the benefit of that act persons professing the Jewish religion.

Also so much of an act passed in the thirty-first year of the reign of the said King George the Third (31 Geo. III. c. 92), intituled "An Act for abolishing any Act, or Acts, or any restrictions, the Persons therein described from certain Penalties and Disabilities to which Papists or Persons professing the Popish Religion are by Law subject," as entails that no person shall be subject to any case, benefit, or advantage to any person who shall, by preaching, teaching, or writing, deny or gainsay the oath of allegiance, atonement, and declaration herein-before mentioned and appointed to be taken as aforesaid, or the declarations or oaths therein contained, or any of them.

Also so much of the said last-mentioned act (s. 15) as provides and enacts, 'that no schoolmaster professing the Roman Catholic religion shall receive into his school for education the child of any Protestant father.' [Law, Criminal, P. C. S., p. 180.]

Also so much of the said last-mentioned act (s. 16) as provides and enacts, 'that no person professing the Roman Catholic religion shall be permitted to keep a school for the education of youth until his or her name and description as a Roman Catholic schoolmaster or schoolmistress shall have been recorded at the quarter or general session of the peace for the county or other division or place where such school shall be situate, by the clerk of the peace of the said court, who shall be required to record such name and description according to any demand by such person, and to give a certificate thereof to such person as shall at any time demand the same, and no person offending in the premises shall receive any benefit or advantage.'

Also so much of an act of the parliament of Ireland passed in the thirty-third year of the reign of the said King George the Third (33 Geo. III. c. 21, s. 14 [1]), intituled "An Act for the Relief of His Majesty's Papists or Roman Catholic Subjects of Ireland," as provides that no Papists or Roman Catholic, or person professing the Roman Catholic or Popish religion, shall take any benefit by or under this act, unless he shall have first taken and subscribed the oath and declaration herein contained, and shall have been appointed by the said act passed in the thirteenth and fourteenth years of his majesty's reign, intituled 'An Act to enable His Majesty's Subjects, of whatever Persuasion, to testify their Allegiance and submission to his Crown, by appearing before the Four Courts in Dublin, or at the General Sessions of the Peace, or at any Adjournment thereof, to be held for the County, City, or Borough wherein such Papist or Roman Catholic, or Person professing the Roman Catholic or Popish Religion, doth inhabit or dwell, or before the going Judges or Judges of Assize in the County wherein such Papist or Roman Catholic, or person professing the Roman Catholic or Popish Religion, doth inhabit and dwell, in open Court.'

Also an act passed in the said thirty-third year of the reign of the said King George the Third (33 Geo. III. c. 44), intituled 'An Act for requiring a certain Form of Oath of Abjuration and Declaration from His Majesty's Subjects professing the Roman Catholic Religion in that Part of Great Britain called Scotland.'

II. And be it enacted, that from and after the commencement of this act her majesty's subjects professing the Jewish religion, in respect to their schools, places for religious worship, education, and charitable purposes, and the property and service of the burial ground allotted to their use, shall enjoy the same footing as the subjects of the Church of England are subject to, and not further or otherwise. [This section makes a considerable change by placing Jews on the footing of the Established Church, and making them dissenters; and it will enable any person to leave a legacy for the instruction of Jews in their religion, which up to this passing of this act could not be done.] (Jews, P. C., p. 128.)

III. Provided, that nothing in this act contained shall affect any action or suit actually pending or commenced, or any property now in litigation, discussion, or dispute, in any of her majesty's courts of law or equity.

IV. That from and after the commencement of this act all laws now in force against the wilfully and maliciously or contumaciously disquieting or disturbing any meeting, assembly, or congregation of persons assembled for religious worship, permitted or authorized by any former act or acts of parliament, or the disturbing, molesting, or misusing any preacher, teacher, or person officiating at such meeting, assembly, or congregation, or any person or persons, and that all subscriptions shall apply respectively to all meetings, assemblies, or congregations whatsoever of persons lawfully assembled for religious worship, and the preachers, teachers, or persons officiating at such last-mentioned meetings, assemblies, or congregations, and the persons there assembled.

ROMAN EMPIRE, EASTERN DIVISION OF—frequently designated the EASTERN EMPIRE, OORRKA EMPIRE, OR EASTERN EMPIRE, is the Eastern Division of the Roman Empire into two parts occurred at an earlier period than the epoch usually fixed, viz. the death of Theodosius the Great; and was the result of causes which had been long in action. The warlike pre-emience of Italy had enabled the Romans to achieve the conquest of the various and distant provinces which constituted the Roman empire, and the vigour of their central government, and the practical wisdom which usually guided it, enabled them to consolidate these provinces under an efficient control. The reality and unity of the Roman government for the first three centuries of the empire, form a remarkable contrast to the disorderly independence of the Greek states of the Persian empire; and its permanence contrasts in an equally striking degree with the immediate dissolution of the Macedonian empire, consequent upon the death of Alexander the Great. Divisions and civil wars did indeed occasionally agitate the Roman empire during the period mentioned, but they did not arise from attempts at separation or local independence, but from competition for the possession of the whole. Dissimulation was not thought.
capital of the empire. Had the empire, however, been as-
sailed by any one hostile power capable of affecting the safety of
the whole, a sense of the common danger might have sup-
plied a motive of some decision, but every trait had its peculiar
enemies to contend with, and apprehended little injury from
those who assailed the other portions of the empire. The
Germanic confederations of the Aleman and Franks [Ale-
man, p. C.], and the Saxons and Angles of the upper
Danubian frontiers, but neither Greece, Syria, Egypt,
or nor even the lower Danubian provinces were endangered by
them: the Goths [Goth, p. C.] might overrun Maso-
und and Sirmium in the upper Adriatic side of the
Hellespont; while the revived Persian kingdom, under
the dynasty of the Sassanides [Sassanid, p. C.], which
threatened the subjugation of the East, was little regarded in
it. This mutual independence of the se-
ailing nations tended to promote the dissolution of the em-
pire by fixing the attention of its several parts on the enemies
immediately opposed to them and allowed neither leisure to
attend to nor sympathy to feel for others.

The direction in which the fracture was likely to take
place was indicated by the geographical and other circum-
stances of the empire. The principal extension of the empire
was from east to west: and the Romans were not enough of
a naval people to avail themselves fully of the facilities which
the Mediterranean Sea afforded for keeping up the connec-
tion between parts of it. The maritime communica-
tions were maintained by land, except where this was
impracticable, rather than by water. Had the Helles-
pont and the Bosporus been wider, the separation would per-
haps have been made there; but the narrowness of those
straits, and the maritime tendencies of the adjacent Greek
population, so closely united the opposite shores, that the sepa-
ration of the European and Asiatic continents was of little
practical moment; and the place of the fracture was deter-
mited to that part of the empire where the communication by
land, narrowed between the shores of the Adriatic and the
nearest part of the Danubian frontier, was impeded by the
difficulties of traversing the Haemus and the Ilyrian
offshoots of the great Alpine mountain system. South of the Mediterranean, the
place of fracture was determined by the great Libyan desert west of Egypt and of Cyrenaica.

Another circumstance which tended to determine the point
of separation was difference of language. Before the Roman
army had crossed the Adriatic the Greek language had become
the language of literature and education in the countries to
the east of that sea, and formed an important bond of union.
The native languages of the East remained in use as spoken
languages, and after the diffusion of Christianity some of them
(e. g. the Syriac and Coptic and Armenian) came into use again as
written languages; but the infatuation of a large extent of the
sacred literature of Asia Minor, Syria, and Egypt was
Greek. West of the Adriatic the Latin tongue acquired a
similar or even a greater supremacy; for it superseded, though
proportionately in a different form, the Greek, andSpain and Italy in popular use, as well as for literary
purposes, and forms the basis of the modern languages of those
countries.

Had the African provinces west of the Libyan desert posses-
sed the warlike resources of the other parts of the empire
it is not unlikely that they would have formed a separate
portion, and thus have led to a threefold division. But neither
did their internal resources allow this, nor was the frontier of the Atlas pressed by any foe so formidable as to require the
presence of an emperor in that part. The Moorish tribes of
the desert, however formidable as marauders, were impotent for
conquering the temper of the provincial governors, e. g. Julius in the time of Diocletian, and Firmus and Her-
cilian in the reign of Honorius, to acquire independence in
Africa were soon put down: and the African provinces, until
their conquest by the Vandals, remained in subjection, except
during a few brief intervals, to the sovereigns of the
West.

(a. D. 288.) The first emperor of the Eastern part of the empire, who ascended the throne in the West, was Diocletian, who,

on appointing Maximian as his colleague, retained to himself
the government of the Eastern portion, which he held till his
abdication, a. D. 305. [Diocletianus, Caius Valerius, p. C.; Claudio-
Marcius Valerius, p. C.] (303.) Valerius Maximus Galerius, usually known as
Galerius, who had, under Diocletian, governed the
Danubian Provinces, with the subordinate rank of Caesar,
succeeded that prince as Augustus or Emperor in the East,

(311.) Flavius Valerius Licinius and Maximinus Dara
succeeded Galerius. Maximian, who was nephew of
that emperor, or was otherwise related to him, was appointed
Caesar shortly after the abdication of Diocletian. Licinius was
appointed Augustus by Galerius, apparently without passing
through the intermediate stage of being Master of the
Horse, but received the title at the same time as Galerius.
Maximian, offended at the elevation of another to a rank superior
to himself, assumed the title of Augustus also. Both however
appear to have professed a sort of reverence to Galerius during his
life. After his death they divided the East be-
 tween them, Maximian having the Asiatic provinces, and
Licinius the European. The West was meanwhile (a. D. 312)
inundated under the sole dominion of Constantine. In a. D. 313
Licinius and Maximin quarrelled; and the latter, after being
defeated by his rival, poisoned himself at Thessalonica. In a. D. 315
war broke out between Licinius, now sole Emperor of
the East, and Constantine, which ended in the defeat of the
former, who ced ed nearly the whole of his European provinces to the
conqueror. After an interval of eight years, war was
resumed between them; and the defeat and capture of Li-
cinius (a. D. 332) reunited the empire under Constantine.
[Maximinus Dara, p. C.; Constantinus, Flavius Valerius, p. C.]

Family of Constantine

(323.) Constantius was a distant relative who reigned till his
deth, a. D. 337. [Constantinus, Flavius Valerius, p. C.]

From him succeeding emperors seem to have taken in almost
every case the name of Flavius.

(357.) In the division of the dominions of Constantine the Great among his three sons, Con-
stantius, the second son, had the East. He is known as
Constantius II., his grandfather, who was emperor of the
[Magnentius, p. C.], the whole empire was reunited under
Constantius II., who died a. D. 361. [Constantius II., Flavius Valerius, p. C.] (361.) Julianus, Flavius Claudius, commonly known as
Julian the Apostate, nephew of Constantine the Great
by his half-brother Constantius, ruled the whole empire for
two years after Constantius. [Julianus, Flavius Claudius, p. C.]
With Julian the family of Constantine ends.

(363.) Jovianus held the whole empire only three months.
[Jovianus, Flavius Valerius, p. C.]

Family of Valentinian.

(364.) Valentinianus I., almost immediately on his ap-
pointment to the empire, resigned the east to his brother
Valerius. [Valentinianus I., Flavius Valerius, p. C.]

(364.) Theodosius I., emperor of the
West, died in the
Gothic War, a. D. 376. [Valens, Flavius Valerius, p. C.]

(378.) Gratianus, son of Valentinian I., succeeded
Valens in the East, but almost immediately resigned it to
his brother Theodosius, the emperor of the West,
which he had held before from his father's death in a. D. 375. [Gratianus, Flavius Valerius, p. C.]

Theodorian Family.

(379.) Theodosius I., the Great, ruled the East during the
remainder of his life, during the last year of which he
acquired the West also, thus for the last time uniting
the whole empire under one supreme ruler. [Theodosius I.,
Flavius Valerius, p. C.]

(395.) Arcadius, the elder son of Theodosius, suc-
ceded his father in the East, and Honorisus, the younger son,
in the West. [Arcadius, p. C.]

(408.) Theodosius II., for the younger son of Arcadius,
succeeded his father while yet in his childhood. He died
a. D. 450. His government was principally directed by his
sister Pulcheria and his wife Eudokia. [Theodosius II.,
Pulcheria, daughter of Arcadius, p. C.] (450.) Pulcheria, daughter of Arcadius, succeeded her
brother Theodosius: she had devoted herself to a life of reli-
gious celibacy, but upon her brother's death she chose as her
associate in the empire Macrianus, a Theriac, whose merit had
raised him from a humble station to high rank. She married
him under an agreement that he should remain a virgin. She
died before her husband.

[a. D. 450.] (450.) Macrianus Valerius may be classed with the Theodosian
family, his connection with which raised him to the
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Basiliscus, who occupied Constantineople nearly two years. He fell at last into the hands of Zeno, A.D. 477, and was sentenced to death, A.D. 477 or 478.  

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(468.) Anastasius I., surmounted Silentiarius, from his being one of the ablest of the Sclerotic clergy. He reigned for the right of Constantine and the preceding Auguste, we have as contemporaries Lactantius [LACTANTIUS, P.C.], or the author, who ever he was, of the book De Mortibus Persecutorum [DE MORTUOS PERSECUTORUM, P.C.]; Epiphanius [EPHESIUS PAMPHILE, P.C.]. The Ecclesiastical History of the latter writer furnishes some notices of such events as are connected with the Christian Church before the reign of Constantine the Great. Eutropius [EUTROPIUS, P.C.] is a valuable contemporary authority for the period (a.d. 383-387) included in the extant portion of his history. Aurelius Victor in his De Caesaribus, and the others' authors, give us the details of this reign, [AURELIUS VICTOR, P.C.], giving an abridgment of the history both of East and West; the De Caesaribus comes down to the reign of Constantius II., and the Epitome to the time of Theodosius the Great. Eutropius [EUTROPIUS, P.C.] in his Historia Romana comes down to the accession of Valens, at whose command he wrote, and Orosius in his History to the reign of Honorius [OROSIUS PAULUS, P.C.]. But these writers are brief, and relate chiefly to the affairs of the West. This is also the case with the more copious and valuable work of Olympiodorus [OLYMPIDOROS, P.C.], which is known to us only by the abridgment and extracts given by Flloitus (Floietus) (HISTORIAE ECCLESIAE, P.C.) of a work of compound extent only to a.d. 409. [ZOSIMUS, P.C. Nor of the affairs of the East are we to be gleaned from the Western Chroniclers, Marcellinus, Prosper of Aquitaine, Prosper Tyro, and Victor of Tunes; from the writings of the Emperor Julian, and of the Christian fathers Athanasius, Gregory Nazianzen, and Chrysostom. [ATHANASIUS, ST. P. C.; CHRYSOSTOM, ST. JOHN, P.C.; GREGORY OF NIZIANZEN, P.C.] Of the later Byzantine writers [BYZANTINE HISTORIANS, P.C.], there are several whose Chronicles or Histories include this period; the most valuable are Theophanes' Chronographia and Zonaras in his História enigmaticale, and Costambaris, and the versifying chroniclers Constantine Manasses and Ephraemus, are of less value; the Chronicon Paschale or Alexandrian Chronicle, though meagre, is of more value. Ecclesiastical History, after the time at which Eutropius closes his history, was written by Socrates [SOCRATES, P.C.S.C.]; Sozomen, and Theodoret [SOZOMENOS, P.C.; THEODORETUS, P.C.], whose works extend from the time of Constantine to that of Theodosius II.; and by Eunapius [EUNAPIUS, P.C.], whose work, designed as a sequel to those of the three writers just mentioned, comes down near to the close of the sixth century. These histories are valuable, not only from the importance of ecclesiastical affairs, but also on account of their frequent notice of secular events. The history of the whole period is contained in the Fall of the Roman Empire by Sienonio, in Lardner's Cyclopedia; and in the great work of Gibbon [GIBBON, S.C.], in his History of the Decline and Fall of the Roman Empire, in the Histoire des Empereurs de Tilmann [TILMANN, SIB. LE NEVE DE, P.C.], who has carefully collected almost everything that has been recorded, and has examined and digested it with critical accuracy and generally sound judgment. The copious but wearisome Histoire du Bas Empire of Le Blanc embraces the period subsequent to the death of Constantius Gallus and the accession of Constantine the Great to the rank and authority of Cæsar. To these works we may add the Historia Byzantina of Ducas.  

(457.) Leo I., called the Thracian (D.GREGORIO), Magnus the Great (OGREGORIO), and Macellus (MCLULLAS), the Butcher, was, like his predecessor Marcellus, a Thracian of obscure family. He reigned seventeen years. [LEO I., P.C.]  

(458.) Leo II., grandson of Leo I., by his daughter Ariadne, came to the throne at the age of four years, and reigned less than a year. [LEO II., P.C.]  

(459.) Zeno, called Isaacus, an Isaurian, who had married Ariadne, daughter of Leo I., was slain by the order of Zeno, A.D. 477, succeeded on the death of the latter. His reign, which was troubled by successive rebellions, is described elsewhere. [ZENO, P.C.] He was for a short time expelled from his throne.  

(460.) Anastasius I., surmounted Silentiarius, from his being one of the ablest of the Sclerotic clergy. He reigned for the right of Diocletian in Epirus, ascended the throne on Zeno's death, by the help of the dowager Empress Ariadne, whom he afterwards married. [ANASTASIUS I., P.C.] His long reign was remarkable for the prosperity and the greatness of the empire, and the peace and the happiness of the nation, and the dimensions of the church as that of Zeno had been by rebellion. With Anastasius ends the dynasty of Leo I., with which indeed both Zeno and Anastasius can only be classed by virtue of their marriage with Ariadne.  

(Family of Justin.  

(518.) Justinus, a Dacian peasant who had risen to be general of the eastern army, succeeded to the government and reigned nine years, when he abdicated the throne, and died soon after. [JUSTINUS I., P.C.]  

(527.) Justinianus I. was nephew by his mother Vigiltiata to Justinus I., succeeded to the throne, but, worn down and disabled by illness, he resigned the exercise of sovereignty a.d. 574 to Tiberius, who was created Cæsar; but Justin retained the title of Augustus until his death a.d. 578. [JUSTINIANUS I., P.C.]  

(565.) Justinianus II. left his brother Vigiltiata to Justinus I., succeeded to the throne, but, worn down and disabled by illness, he resigned the exercise of sovereignty a.d. 574 to Tiberius, who was created Cæsar; but Justin retained the title of Augustus until his death a.d. 578. [JUSTINIANUS I., P.C.]  

The dynasty of Justin I. ends with Justin II.  

(578.) Tiberius II., or more fully Flavius Constantinus Tiberius Amphilochius Turbars, wielded the sovereignty with the title of Cæsar from a.d. 574, and received the title and authority of Augustus just before the death of Justin II., from which latter period he reigned four years. [TIBERIUS II., P.C.]  

(592.) Mauritius of Mauritius, had been created Cæsar by Tiberius II., whose daughter Constantia he had married. The reign of Mauritius was chiefly marked by wars and negotiations with Persia. Having become unpopular, he was murdered, with most of his family, by the centurion Phocas. [PHOCA, P.C.], who headed a revolt of the army in Thrace [PHOCA, P.C.], murdered Mauricius, and succeeded to the throne. This bloody tyrant occupied the throne till he was deposed and put to death by Herulfius, a.d. 610.  

From the time of Diocletian to that of Justin I. the limits of the Eastern empire underwent little alteration except by the acquisition of Northern Mesopotamia and of five provinces east of the Tigris, in the reign of Diocletian, and by the cession of these acquisitions by Justinian after the death of Julian the Apostate. Part of the Greater Armenia was annexed to the empire by Theodosius the Great; the Eastern empire was indeed repeatedly invaded; and the Goths in the time of Valens, and the Bulgarians in the reign of Anastasius, had nearly overthrown it. The eastern frontier was almost continually exposed to the hostilities of Persia. Empress Eudoxia, who died a.d. 477, was the first time of Zeno shook the empire to its centre; but it recovered from these shocks, and the reign of Justinian I. was successful in aggression. The Western empire had been extinguished during the reign of Leo I., and the invasions of Justinian were directed against the provinces of the West, which different nations of barbarians had occupied. Africa and apparently Mauretania, and even a small part of Spain, were recovered from the Visigoths by Belisarius, and preserved by the Vandals; and Sicily, with Sardinia, Corsica, and Sardinia, were conquered by Belisarius and Narses. The northern part of Italy and the inland parts as far south as Beneventum were indeed soon lost to the empire by the Lombards, but the kingdom of June the Lombards [LONGOBARDS, P.C.], who gradually extended their encroachments; and the African conquests of Belisarius were in the latter part of the Byzantine emperors; who retained a footing in Italy and Sicily (though their possessions were continually disputed by the Latin and the Saracens) almost to the time of the Crusades. The period from Justinian to Heraclius, the period of the Huns to Phocas, was that of the greatest extension of the Eastern empire. The cession of the provinces east of the Tigris in the reign of Justin I. was far more than counterbalanced by the
acquisition of part of Armenia under Teodosius the Great, by the western conquests of Belisarius and Narses, and by the extension of the Byzantine territory by conquest or settlement along the eastern and northern coasts of the Euxine, the progress of which is not easy to trace. Even after the loss of the northern part of Italy, the Eastern empire was larger than it had been under the emperors who preceded Justinian.

The principal historical authorities for the period from Leo the Thracian to Phocas are Theophanes, Isaccius, Zonaras, the Patriarch John of Smolensk, Malalas or Malalas, Michael Glynas, Joel, and the versifiers: these several writers comprehend the whole period, with the exception of Malalas, whose "Chronographia" relates only during the reigns of Justin I and Justin II. The wars of Belisarius are related by Procopius of Caesarea, whose introductory chapters to his "Bellum Vandalicum," "Bellum Goticum," and "Bellum Persicum," contain some important notices of events previous to that time. The Secret History (Historia Arcana) of Procopius relates to the same period. Agathias relates the events of a.d. 553-559. The history of the Emperor Mauricius (Historia Mauricianae) is related by Theophylactus Simocatta; and the reign of Phocas is included in the work of Nicephorus of Constantinople, De Rebus post Mauricium pontificum, and his Historical History of the Chalcedonian Controversy, comes down to the reign of Mauricius, a.d. 594; and that of Nicephorus Callistus, a writer of much later date, to the accession of Iconoclastes. The reign of Iconoclastes, which lasted for three years, was an exact reproduction of the Tlemcens; but the whole period is included in the works of Ducaeus, Gibbon, Smendius, and Le Beau.

Heraclean Dynasty.

(610.) Heraclius, son of the patrician Heraclius, governor of Africa, driven from Phocas and put him to death. His reign was one of the most interesting and eventful in the whole course of Byzantine history; and his character one of the most subject to change. The earlier part of his reign was characterized by brilliant and successful warlike enterprises, by which the empire was saved from impending ruin. The earlier part was characterized by inactivity, and the latter part by sensuality and carelessness. (HERACLIUS, P. C. and P. C. S.) He reigned above thirty years.

(641.) Constantine III., or more fully Flavius Heraclius Constantius, or Novus Constantinus, was the son of Heraclius, his first wife Eudocia Palia. The name of Constantine was given in the hope that he would renew the glory of the great Constantine. He reigned only about three months, being, as was suspected, poisoned by his step-mother Martina, niece and second wife of Heraclius; she being anxious to make her son Heraclonas (who had been, by his father's will, made colleague with Constantine) sole occupant of the throne.

(643.) Heraclonas. The death of Constantine III. excited a revolt against the government of Martina, who ruled in the name of her son; and both she and Heraclonas were compelled by Valentian or, as it was called, and called by him, to crown his son Heraclonas, son of Constantine III., to a share in the empire; and were soon afterwards deposed, imprisoned, mutilated, and sent into exile, where they died.

(647.) Constantius II. (Constantius, son of Constantine the Great, who had ruled the Western empire) was originally named Heraclius. He ascended to the throne in his eleventh year, and reigned for twenty-seven years. During the first few years of this reign the government was virtually in the hands of Valentine; but Constantius, when he attained to manhood, unceasingly exerted himself to extend and consolidate his eastern territories, already much diminished by the progress of the Caliphate, and still further diminished by the extension of that ruinous empire. Arab, P. C., vol. ii. p. 217; they were, however, vain and unfortunate. His eastern territories, already much diminished by the progress of the Caliphate, were still further diminished by the extension of that ruinous empire. Arab, P. C., vol. ii. p. 217; and the destruction of the city of Rome. The murder of his brother Thibaudus by the emperor's order (a.d. 661) made Constantius a prey to the horrors of remorse. He turned over to Constantinople in 662, and was there placed in the house of the empress, where he was placed in prison. When the Emperor Constantius IV. (669.) Pogonatus, or Heraclius, the Braved, eldest son of Constantius II., succeeded his father. He had been left by his father governor of Constantinople a.d. 663; and on the news of the assassination of Constans, and of the revolt of the Gepidæ and the Goths he took the field with a powerful army and defeated the rebel leader with great loss. He was a man of great courage and determination, and he was a man of great courage and determination. He was a man of great courage and determination. He was a man of great courage and determination. He was a man of great courage and determination. He was a man of great courage and determination.
events which he relates. The Monothelite controversy is discussed largely by St. Maximus, one of the Greek fathers. (711.) PHILIPPUS BARADAS succeeded to the now vacant throne. He patronized the Monothelites. His reign was short: he was deposed, blinded and imprisoned, A.D. 718, by Basil, an officer sent by the one of his generals, George Buraphus, who had rebelled in Asia Minor. (713.) ANASTASIUS II. (previously to his accession he was called Aristius) succeeded Basil. He patronized the orthodox faith in opposition to the Monothelites. He was deposed and anathematized A.D. 715 by the troops which he had sent to attack the Saracens in the port of Alexandria. [ANASTASIUS II., P. C.]

(715.) THEODOSIUS III. made some cessions of territory in Thrace to the Bulgarians. He was deposed (A.D. 715) by Leo, one of his officers, who commanded in Asia Minor. [THEODOSIUS III., P. C.]

**Isaurian dynasty.**

(718.) Leo III. Isaurius, the Isaurian, had borne in early life the name of Conon: he was a native of Isauria in Asia Minor, from which circumstance he is known in history as Leo Isaurius, or the Isaurian. [Leo III., P. C.] He died A.D. 741, after a reign of twenty-three years.

(741.) CONSTANTINE V. surnamed Corinthius, because when he was in his infancy he was relieved thereto as an able and energetic prince; but his reign was characterized by varied success in the field, and by the religious troubles aroused by the Iconoclastic controversy. He is charged with employing cruel and remorseless means in his war against the church, and as oppressor of the so-called orthodox party; but the Iconoclasts, whom he favoured, revered him as a saint. The revolt of his brother-in-law Artabas, or Artavasdes, or Artavmentes, who was exiled and deposed, and crowned with him, and was apparently supported by the image-worshipping party, was near proving fatal to him; but in the end (A.D. 743) he recovered Constantinople, which Artavasdes had only occupied for five days; and the emperor Constantine died A.D. 775, and was succeeded by his son Leo. [Leo IV., P. C.]

(775.) Leo IV., surnamed Chazarus, which name he derived from his mother Irene, who was a daughter of the Chazars, a Turkish nation, and who accompanied her husband in the Volga. [TARTARS—CHAZARS, P. C., vol. xxvi. p. 73.] The reign of Leo was short, but was disturbed by the revolt of his brothers, who were exiled, and by hostilities with the Saracens, who were defeated. Leo died A.D. 780. [Leo IV., P. C.]

(780.) CONSTANTINE VI., sometimes called Phrygroceius, or more accurately Phrygogrossetes, which title is however usually appropriated to Constantine VII., son of Leo VI., succeeded his father, while yet a minor, under the guardianship of his mother Irene, an Athenian whose beauty and genius had captivated Leo. Her endeavours to prolong her son's minority were to no purpose; her influence was withering and blinding, if not the death, of Constantine, A.D. 797.

(797.) Irene, widow of Leo IV., succeeded her son. A project is said to have been formed of uniting the Eastern and Western Empires, and of recognizing Emperor Charlemagne. According to Theophanes and Zonaras and Cedrenus, Charlemagne sent ambassadors for the purpose of arranging the marriage, which was defeated by the influence of Anastasius, then powerful at the Byzantine court. The Western writers, while speaking of the embassy, are silent as to the marriage being one of its objects. Irene was deposed A.D. 802, by Nicephorus, one of her officers, who usurped the throne. The Isaurian dynasty ends with her. It occupied the Byzantine throne eighty-four years. During the reign of the Isaurian princes the empire continued to decline. The emperors, with the exception of Basil II. and Constantine V., were able and active, their power was weakened by religious dissensions. A few years after the commencement of his reign Leo had attempted to put an end to the use of images in the churches. But the issue of the quarrel was not decided in the church, and the emperor, which showed up with even greater earnestness by Constantine, convulsed the whole empire. The successive popes and the bulk of the clergy declared in favour of images; the secular power was with them. Thus the Iconoclasm was dealt a fatal blow. The opposition was reawakened in Italy and the adjacent parts of Italy from the Byzantine Empire, which retained only the southern extremity of that country. This formed an adjunct of the province of Sicily, under the title of Sicilia Secunda, 'the Second Sicily,' from which circumstance it has arisen the designation of 'the two Sicilies,' as applied in modern times to the kingdom of Naples. The use of images was restored by the influence of Irene and by the authority of the seventh general or second Nicene Council, A.D. 787.

The authorities for the Isaurian dynasty are the same as for the Heraclean; but Nicephorus of Constantinople does not come lower than the reign of Michael. The history of the Iconoclastic controversy is given in Gibbon (chap. xlii.) and in the various modern ecclesiastical histories. In that published by the Useful Knowledge Society the account will be found in chap. xii.

(802.) NICEPHORUS I. [NICEPHORUS I., P. C.] fell in battle against the Bulgarians after a short and calamitous reign of nearly nine years.

(811.) Stepheius, son of Nicephorus, was mortally wounded in the same battle in which his father fell: but lingered for some months, during which he was deposed, and was succeeded by Michael Rhangabe.

(811.) Michael I., surnamed Rhangabe, had married Procopia, daughter of Nicephorus. His short reign was unfortunate: and being defeated by the Bulgarians and threatened by the revolt of Leo the Armenian, he abdicated the throne A.D. 813.

The **Chronography of Theophanes**, one of the most important authorities in Byzantine history, ends with the reign of Michael Rhangabe.

(820.) Leo V., called Leo V., P. C.), surnamed from the country of his birth ARMENUS, THE ARMEANS, seized the sceptre from the feeble grasp of Michael Rhangabe. He defeated the Bulgarians, who had penetrated to the walls of Constantinople, and reduced to tributary the whole of the empire. He patronized the Iconoclasts, who now gained the ascendant and persecuted the orthodox. After a vigorous and successful reign, he was murdered by the friends of Michael, one of those officers who had condemned to death and was on the point of executing.

**Dynasty of Amorian.**

(820.) Michael II., surnamed Balises or the Tamer, or, from his birth—Thronod, a Turk—of Amorion, was rescued from prison by his friends, and placed on the throne. He also favoured the Iconoclasts. His reign was without event. The Saracens conquered Crete and Sicily, and almost conquered what remained to the Eastern Empire in Italy; and Michael was twice besieged in his capital by one of his own subjects, Thomas, who had rebelled, but whom, by the aid of the Bulgarians, he at length conquered. He died A.D. 889, and was succeeded by his son Theophilus.

(892.) Theophilos, a vigorous and active prince, was continually engaged in war, but with little success. He protected the Iconoclasts and persecuted the orthodox, yet he has escaped the reproach of heresy by the decision of the council. In 829 three Isaurian princes who followed the same course. He died A.D. 842, and was succeeded by his son Michael.

(842.) Michael III., surnamed Eudemos, the Drencher, came to the crown in minority, and was under the care of Theodore, who restored the use of images and finally crushed the Iconoclastic party. During the reign of the absolute Michael war was carried on unfortunately against the Saracens in the neighbourhood of the Caucasus, in Crete, and in Asia Minor; but the Slavonians, who possessed themselves of Greece, were subdued, and the Bulgarians and the Saracens were converted to Christianity; a change which either abated their warlike restlessness, or diminished their hostility to the empire. Michael was assassinated (A.D. 867) by Basilios or Basil I., whom he had raised to be his colleague in the empire. The Amorian dynasty ended with him.

During the reigns of the Amorian princes the decline of the empire continued, and would have been more rapid but for the diminished power and energy of its great rival the Caliphate. (The Caliphs of whom are not been sufficiently studied at an earlier period), Crete, and Sicily were lost; and the remaining Byzantine territories in Italy were nearly lost in the reign of Michael II.; and the activity and value of Theophilos was by the possession of the central parts of Asia Minor: for the regions south of the Taurus appear to have been already subdued. The history of Leo the Armenian and of the Amorian dynasty is continued in the works of Porphyrjus, Lycias, Jo6, Ephracinus and Constantine Manasses; in the *Chronographia* of the anonymous continuator of Theophanes, in the works of Leo Grammaticus and Symeon Magister, in
the Vita Imperatorum Recensiones of Georgius Monacenus, and in the Reges of Genesius: the continuator of Theophanes and the writers subsequently enumerated, all commence their histories with the reign of Leo V., at the point where Theophanes ceases.

Macedonien Dynasty.

(867.) Basilii I. Macedon, or the Macedonian, an extraordinary man, the son of a small landowner in Macedonia or Thessaly (which latter word is used by some among the Bulgarians, by whom in his youth he had been carried captive, to the possession of the Byzantine throne, by becoming the colleague of Michael III., whom he soon after murdered. He subjugated the Avars, a fierce nation, and after a long persecution, had driven into revolt, and recovered a considerable part of Asia Minor and the south of Italy and Sicily from the Saracens, who had conqueror them. He died a.d. 886, and was succeeded by his son Leo. [Basilii the Macedonian, P.C.]

(886.) Leo VI., surnamed Philosophus, the Philosopher, or Sapientes, the Wise, was engaged in wars with the Bulgarians in the north, and in the south with the Arabs, who attempted to recover Sicily; but his wars were on the whole unfortunate. He died a.d. 911, and was succeeded by his son Constantine. He was the author of various works, the chief of which are noticed elsewhere. [Leo VI., P.C.]

(911.) Constantini VII. Porphyrogenitus, or Porphyrogenitus, succeeded his father while yet a child of six years. He had for his first colleague the son of Basil II., next in order of birth to Leo VI. He died after a reign of a year a.d. 912. The next colleague of Constantine was

(919.) Romanus I., surnamed Lecapenus or Lecapenus Basilus, who assumed the title of Emperor a.d. 919, and subsequently raised his three sons, Constantius in a.d. 919, and Stephanus, and Constantius VIII., in a.d. 928, to the title at least of emperors. Romans succeeded his administration of affairs to Basil II. Constantine VII. only the title of emperor, compelling him to pass his time in retirement, in which he became distinguished by his literary and other accomplishments. But in a.d. 944 Constantine, who had been the last successor of his predecessor, was restored to the possession of the imperial power. The triumph of Constantine had been for some time dead (a.d. 931 or perhaps 926), and Stephen and Constantine, the surviving sons of Romans, had just before expelled their father from the throne, and were themselves deposed by the people, who restored Constantine to the actual possession of the sovereignty, which he retained till his death a.d. 959, carrying on war with considerable success against the Arabs, and receiving the submission of the Iberian mountain states. His literary works are of considerable importance [Byzantine Historians, P.C.] and include: 1. The Life of his grandfather Basil the Macedonian, written by his son Constantine in the Chronicles of Theophanes. 2. De Thematibus, a description of the thematic or military provinces of the empire. 3. De Administrando Imperio, 'On the administration of the Empire,' written by order of Romanus, son and successor of Constantine. 'It contains' (says Dr. Plate, in Dr. Smith's Dictionary of Greek and Roman Biography) 'abundance of geographical, historical, ethnographical, and political facts of great importance; and without it our knowledge of the times of the author, and the nations which were either his subjects or his neighbours, would be little more than vagueness, error, or complete darkness.' 4. 5. Two works on military affairs, respectively styled Tactica, 'Tactics,' and Strategica, 'Strategies.' 6. De Ceremoniis Aulae Byzantinae, 'On the Ceremonies of the Byzantine Court,' a detailed account of the observances of royalty and administration at that time. We have also in Constantinian various valuable Collections or compilations, especially that of Deoplogomenon, on the Embassies of the Romans to other nations and of other nations to them; which contains numerous valuable Excerpta from Polybius and other historians of the Colons, or on veterinary medicine and on agriculture. [Geoponika, P.C.]

(950.) Romanus II. [Romanus II., P.C.] distinguished as Junior, the Younger, sometimes as Fiesus, the Boy, reigned only a little over a year a.d. 959. His death a.d. 963 of poison administered to him by his wife Theophane.

(963.) Basilii II. and Constantinos IX., or as some call him (not recognizing the son of Romanus Lecapenus) Constantinos XI. and Basil, the two sons of Romanus II.; but their predilect mother and guardian Theophane married Nicophorus, a valiant and successful general, and raised him, nominally to a share, but actually to the sole possession of the empire.

(963.) Nicophorus II. Phocas exhibited as a sovereign the same military skill and valor which he had previously shown to his new master, Basil II., P.C. He was the first to bring the war of existence to a close by war; in the east he was successful: Cilicia and the north of Syria, with the strong cities of Tarsus, Antioch, and Aleppo, were recovered; and even Mesopotamia was reconquered. The war in Asia Minor was less signal and complete: he could only dispute with the Saracens and with the Western Emperor (Theo) the possession of the southern extremity of Italy and of the island of Sicily. In Africa he was not victorious, but was able to subdue a part of the country. The defeat of Nicophorus made him unpopular, and the infamous Theophano, who was weary of him, conspired with his paramour John Zimisces to assassinate him. He was murdered a.d. 969.

(969.) Ioannes I. Zimisces or Zimisce, surnamed (Theopilos) succeeded to the sovereignty of Nicophorus; and, like him, was distinguished by warlike pre-eminence, both as a subject and as emperor. One of his first acts was to banish the guilty Theophano. A rebellion, raised by Bardas Phocas, was soon suppressed; and John was equally successful against foreign foes. He defeated the Russians, who had nearly conquered Bulgaria; and restored the Bulgarian king to his throne, but in subordination to the empire: he recovered the empire, though only for a short time, its long lost possessions in Mesopotamia, and extended the conquests of his predecessor. But his long and brilliant career was cut short by poison administered by some of his own courtiers, after a reign of only six years.

From a.d. 973 begins the actual reign of Basil II. [Basilis Leucis] who arrived at maturity to exercise the sovereign power, and of his brother Constantine; but the youth of Constantine in the first instance, and afterwards his luxurious indulgence and carelessness, left the government to the able and energetic Basil. A dangerous rebellion by Bardas Sclerus, was with much difficulty suppressed, and the conquest of Byzantine Italy and Sicily by Otho or the Sarracens was prevented by the wise and able chief by the imperial power. Having Christianized the Christianized the Slavonic language and made it a medium of education, and made it a medium of education, and had succeed in the struggle for the possession of those countries. His martial prowess retained the conquests of his predecessors in Syria, despite of the efforts of the adjacent Saracen powers. By the complete overthrow of the Bulgarian king he restored the long lost frontier of the lower Danube, as far up as Sirmium; he defeated the Caucasian mountaineers and protected the empire from invasion and was preparing for the complete conquest of Sicily and Byzantine Italy when he died a.d. 1025. Constantine survived his brother another three years; and his death a.d. 1028 closed the golden age of the Macedonian dynasty (though it continued in the female line still longer), the supremacy of which was of longer duration than that of any other imperial dynasty, except the closing one of the Palaeologi.

The Macedonian period of a hundred and sixty years was one of apparent, if not of real development. The frontiers of the empire had been extended in the north from the defiles of Mount Haemeus to the bank of the Danube, and in the south from the range of the Taurus to the heights of Lebanon and the banks of the Euphrates and even of the Tigris. The throne had been occupied by several warlike princes, and the decay of the rival powers, the Caliphate [Caliphs, P.C.] and the Bulgarian kingdom, rendered their prowess effectual for the revival of Byzantine greatness. The literary taste and achievements of Leo VI. and Constantine VII. conduced much to the revival of literature; and several valuable writers belong to this period. The history of this era is contained in Zonaras [Zonaras, Ioannes, P.C.], Codruses, Glycas, Ephremius, and Constantius Manasses; the anonymous continuator (or continuator) of Theophanes, whom we shall sometimes call, but on insufficient ground, Leoontius, Symeon Magister, Georgius Monachus, Leo Grammaticus, and Genesius. Of these authors Genesius ends with the death of Basil II. a.d. 1025; Leo Codruses, with the death of Romanus I. a.d. 948 or 949, a few years after his deposition; and the continuator and Symeon Magister, with the early history of Basil II. To this time belongs a second part of Jomard [Jomard], who lived in the reign of Basil II., and whose history comprehends the reigns of Romanus I., Nicophorus Phocas, and Ioannes Zimisces (a.d. 969-1078).
Torysh.] Sossidion's Fall of the Roman Empire ends with the tenth century.

[Romans] III. surnamed Argynus or Argyropulos, ascended the throne as the husband of Zoë, one of the daughters of Constantine IX., who also left another daughter, Theodore. Romans, after a short reign, in which his troops were defeated by his brother who, on the death of his father, was assassinated by his wife and her paramour Michael, whom she elevated to the throne. [Romans III., P. C.]

(1054.) Michael IV. Papitchio, the Paphlagonian, reigned meanly and miserably for more than seven years and a half.

(1041.) Michael V. Calaphates or Calaphata, i.e. a governor of vessels, a name derived from the occupation of his father, who was a Basilian and a man of Zob, but the people of Constantinople, inspired with indignation at this punishment inflicted on one of her high birth, insisted on her recall, and on the release of her sister Theodore from the monastery in which she had been placed, and disposed Michael, depriving him of his eyes, after he had reigned little more than a year.

(1042.) Zoë and Theodore reigned jointly for a few months, when Zoë married and raised to partnership in the empire.

(1042.) Constantius X., or as some reckon Constantine IX., surnamed, from his valour, Monomachus, the Single Commander. This emperor had to avenge a revolt in Crete, to which the Qoloiki, a nation of Muslims, had manifested a decided sympathy when they had gone to defend his throne from his rival, Georgius Maniakes, the greatest of the Byzantine warriors of his day, who being driven by injustice to revolt, advanced against Constantinople and laid the capital in ashes; but the empire fell, probably by assassination, in the moment of victory. Another rebel, Leo Tornicius, a relative of the emperor, was defeated by Constantine, who also vanquished a Russian fleet which threatened Constantinople [Romus, P. C.], and extended the limits of the empire in the East by incorporating the territory of a subordinate chieftain of Armenia and Iberia who had revolted and was subdued. Zoë died a.d. 1050 and Constantine a.d. 1054.

Theodora was thus left sole inheritor of the sovereignty. She had previously refused to marry; but toward the close of her short reign, she consented, on her death-bed, to a nominal union with an aged warrior named Michael.

(1056.) Michael VI. Stratelates, thus succeeded to the empire, which he held for about a year, when he was married. Theodora had died a few days after their marriage. The short reign of Michael VI. was troubled by the unsuccessful revolt of Theodolus, a cousin of the late emperor Constantine X.

(1057.) Isaac I. Comnenus, whose successful revolt had deposed Michael VI., obtained the empire, but was soon after induced by his failing health to resign it. The succession was offered first to Joannes Comnenus, the Emperor's brother, who declined it; and then to Constantine Ducas.

(1059.) Constantius I. (or X.), surnamed Ducas reigned seven years, in which the empire was assailed by the Hungarian and other enemies on the side of the Danube. On the description of this part of his reign.

(1062.) Michael VII. surnamed Palaiologos, Andronicus I., and Constantine XII. (or XI.) Porphyrogenitus, or Porphyrogenitus, all minors, succeeded to the nominal possession of the throne, under the guardianship of their mother Eudocia [Eudocia, P. C.], who after a regency of some months conveyed by marriage the actual sovereignty to Romania, the mother of her sons.

(1067.) Romans IV. surnamed Doukas, valiantly opposed the progress of the Turks, who were in force in Asia Minor, but his efforts resulted in his defeat and captivity (a. d. 1071). [Seljukus, P. C.] On his release, he attempted to escape and was taken prisoner, and deprived of his eyes with such cruelty, that he died a few days after. [Romans IV., P. C.] Eudocia had, during his captivity, been confined in prison.

Michael VII. then assumed the exercise of the sovereign power: but by his cowardice he incurred the contempt of his countrymen, and his brother's, and he was succeeded by the rebel Nicophorus Botanoteinos, who succeeded to the throne at the reign of the family of Ducas ended with Michael VII. It occupied the Byzantine throne less than twenty years.

[Romans III. Botanoteinos, P. C.] had to struggle for the throne with a rival, Nicophorus Bryennius, who had revolted against Michael at the same time as his namesake. Alexius Comnenus, the general of Botanoteinos, defeated Bryennius, and compelled him to leave the empire, but shot the deposed emperor on his own account, and succeeded (a. d. 1081) in deposing Botanoteinos and acquiring possession of the throne. He was the nephew of the Emperor Isaac I., and son of that Joannes or John Comnenus who, on the death of his father, had assumed the crown. The accession of Alexius was the commencement of the permanent sway of the Comnenian family or dynasty.

The century and a half which elapsed from the close, at least in the narrow limits of the Macedonian Empire, of the accession of the Comnenian, was a period of disaster and decline. The various domestic revolutions, several of them accompanied by bloody civil wars, have been noticed. In the West, the first visit of the pilgrims, then, on the invitation of a fugitive revoler of the Byzantine city of Bari, as mercenary soldiers, had gradually conquered, between a.d. 1040 and 1080, the Byzantine portions of Italy and Sicily, the last relics of the conquests of Belisarius and the other generals of Justinian. In the East, the Turks, under their sovereigns of the Seljuk dynasty [Seljukus, P. C.; Turgut, Turgu, P. C.], conquered the Caucasian and Armenian provinces of the empire, and either before or very soon after the accession of Alexius, succeeded in establishing in Asia Minor a kingdom of which the capital was fixed at Nicaea, or Nice, in Bithynia, about a hundred miles to the west of Constantinople.

The disasters of the period were augmented by the increasing bitterness and the complete separation of the Greek and Latin churches [Greek Church, P. C.], which weakened the defense of the empire, and the small degree of the Sultan of Egypt and the West of Europe, and led the latter to regard with comparative indifference the threatening progress of revolted Mohametanism under the protection of the Turkish power.

For the history of this period we have to refer to the generals already enumerated; but Cedrenus ends with the year 1058, and Constantine Manasses with a. d. 1081. To these we may add Joannes Skylitzes Comnenus, the fragments of whose history refer to the period from a.d. 1058 to 1078; Nicophorus Bryennius (not the Emperor so called, but the son-in-law of Alexius Comnenus), whose Commentarii give the history of Alexius before his accession to the empire; and Anna Comnena, daughter of Alexius, and wife of this Nicophorus, who has in her Alexius given the history of her father's life.

[Romans III. P. C. Crusades, P. C.]

(1081.) Alexius of Alexius I. Comnenus. The commencement of the long reign of this prince was unfortunate: the Turks pursued their conquests on the east, and the Normans, crossing the Adriatic, invaded the western provinces of the empire. The hostility of the Turks was however repelled, and that of the Normans diverted by the first Crusade; and Alexius, following in the wake of the Crusaders, recovered possession of Asia Minor, with the exception of the islands and mountainous districts. He died a.d. 1118. [Romans I., P. C.; Crusades, P. C.]

(1118.) Joannes II. Comnenus, or as he is commonly termed Galo-Joannes, who reigned ten years, given in detail on account of his diminutive stature and homely features, succeeded his father Alexius. His eminent virtues rendered his reign one of the most truly glorious in the Byzantine annals.

He repelled the hostile attempts of the Hungarians and others on the Danube, and of the Turks in Asia. A vain attempt to dispose of him at the commencement of his reign was made by his accomplished but ambitious sister Anna Comnena and her husband Nicophorus Bryennius. [Anna Comnena, P. C.] Joannes II. died of a wound received while hunting, a.d. 1143, just as he was on the point of attempting to subjugate the Latin States founded by the Crusaders in Syria and Asia Minor, a.d. 1144. [Manuel I. Comnenus bore, in character, a singular resemblance to our own Richard I. He continued the warlike enterprises which his father had made, and against the Turks in Syria and Egypt. His transactions with the Crusaders were very varied. The Latin States were not restored to the Latins, but they were spent in indolence, his wars and luxuries alike exhausted his subjects, and his long struggles merely maintained, without extending, the limits of the empire.]

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(1180.) Alexius III. Botanioteinos, who had succeeded to the throne on the death of his father Manuel I. He was only ten years of age at his accession, and was under the guardianship of his mother Maria; but both mother and son were, in about three years, put to death by Andronicus, son of Isma Comnenus, who was a younger son of Alexius I.
(1183.) Andronicus I. Comnenus then usurped the throne, but after a reign of two years was murdered by the people of Constantinople. [Andronicus Comnenus, P. C.] In him the male line of the Comneni ends. He was succeeded by Isaac Angelus, whom he had attempted to put to death, and who perished in the populousness against Andronicus.

(1185.) Isaac II. Angelus was descended from the youngest daughter of Alexius I. His contemptible reign was marked with the final loss of the isle of Cyprus, usurped by a rebel, another Comnenus, from whom it was taken by Richard I. of England and given to Guy of Lusignan, the expelled King of Jerusalem; and of the territory between the Haemus and Bupleus, which was lost in the revolt of the Bulgarians and the re-establishment of their kingdom, the princes of which united themselves and their people to the Latin Church. Isaac recovered, however, some parts of the European Albania and Epirus from the Normans of Italy and Sicily. Isaac was dethroned and blinded after a reign of ten years by his own brother, Alexius, who succeeded him.

(1195.) Alexius or Alexius III. Angelus or Comnenus (which latter name he assumed), after an unfortunate reign in which he was defeated by the Turks in Asia Minor and by the Bulgarians and Comanis in Europe, was dethroned by Alexius, son of Isaac II., who was assisted by the Crusaders of the Fourth Crusade.

(1203.) Isaac II., the deposed and blinded emperor, and his son Alexius III. Angelus or IV. Angelus, were, in consequence of this revolution, placed on the throne; but a revolt of the populace, led by Alexius, son of the house of Ducas, led to their deposition and to the murder of Alexius IV., whom Isaac II. soon followed to the grave. The branch family of the Angeli, and indeed the dynasty of the Comneni, ended with the death of Isaac II.

(1204.) Alexius of Alexius V. Ducas, surnamed Murzoukides, i.e., of the Shaggy Eyebrows, the successful rebel, succeeded to the throne (which a shadow of an emperor, Coloman Alexius, and not an instant occupant), but was at once besieged, and after a few months taken prisoner and put to death by the Crusaders, who captured Constantinople, divided a considerable part of the conquered territory into principalities, and established a line of Latin princes on the throne of the Eastern Empire. [Baldwin I. Emperor of Constantinople, P. C.; Danilo, Enrique, P. C.]

The period from the accession of Alexius I. to the capture of Constantinople by the Latins is one of great vicissitude. Alexius I. found the empire reduced in limits and exhausted in resources; but his dexterity in availing himself of the results of the first crusade, and the abilities and valor of his successors Johnnies II. and Manuel I. extended the limits without perhaps materially increasing the strength of the empire. From the death of Manuel we have a period of rapid career, occupied in the conquest of Nicæa, the Seljuk Turks losing a considerable part of what they had lost in Asia Minor: until the empire was limited to Thrace, Macedonia, Epirus, Greece, i.e., its islands (of which, however, Constantinople was lost by the Greeks in 1264, and emperor of a portion of Asia Minor, especially on the coast. Of this diminished territory a considerable part fell with the capital to the hands of the Latins. Of that part which escaped their power, the eastern coast of the Euxine was appropriated to form the new Greek empire of Trebizond or 'Anatoilia (Trebizond, Empire of, P. C.); and two other fragments were detached to form the despotates of Epirus and Thessaly, the former of which, though sometimes tributary to the Eastern Empire, was never again incorporated with it. [Albania, P. C.] The remainder of the independent empire of the Greeks was the republic of Venice, which assumed the imperial title, fixed the seat of their government at Naos or Nicæa, in Asia Minor, and afterward recovered Constantinople, will be regarded as the connecting link between the two great states, of which the former was the capital, and the latter the capital of the new Greek empire. These states were formed by the Greeks almost immediately after the fall of Constantinople. The history of Alexius I. is contained in Zoparas and Glycas; but especially valuable is his Anabasis, and the shorter work of Joel, in the Monocentric Chronicle of Ephraeminis, which becomes from his reign now more full and important; and especially in the Alexios of his daughter Anna Comnenus, P. C. The history of the subsequent period is narrated by Ephraeminis and Joel, of whom the latter ends with a.d. 1204; and in the histories of Cinnamus, which compreends the reign of Johnnies II. and nearly the whole of that of Manuel I., and of Niceives Comnenus, and Niceives Choniates, which extends from the death of Alexius I. to the death of Baldwin I., first Latin emperor, a.d. 1206. The Latins authorities, Guilielmus Tyrannides (William of Tyre), and the other continenetals, of which the Per Franciscus of Comnenus, and Bonogon and others not of that collection, are enumerated in Michaud's Bibliographie des Croisades. [Crusades, P. C.]

(1204.) Baldwin I. Baldwin I., P. C., Count of Flanders and Hainault, was appointed emperor by the victorious crusaders; but was, after a year's reign, captured in Thrace and the Bulgarians and the Boherns, and the Bulgarians their allies, and died in captivity.

(1206.) Enrique or Henry, surnamed andreanensis, of Amoq, brother of Baldwin I., succeeded him. He died after a reign of incessant warfare a.d. 1216.

(1216.) Peter de Courtenay, Peter of Courtenay, Count of Acre, ascended the throne in conjunction with and in the right of his wife Isabele of Yolande, sister of Baldwin and Henry. He never reigned in Constantinople, but was taken prisoner on his way thither by the despot of Epirus, and died in captivity a.d. 1219. Yolande died soon after.

(1219, or, according to others, 1221.) Robert, or Robert, Count of Courtenay, succeeded Peter of Courtenay, and succeeded to the throne. He was, some time after, expelled by his own subjects, and died a.d. 1228.

(1228.) Baldwin II. Baldwin II., Emperor of Constantinople, had in a.d. 1229 taken the city of Yolande, succeeded his brother Robert; but, as he was a minor, John of Brienne (John of Brienne), titular king of Jerusalem, a veteran of nearly four years, was appointed (a.d. 1229) his guardian. John repelled the Nicene Greeks and the Bulgarians, who had besieged Constantinople, and died soon after a.d. 1237. The reign of Baldwin in Constantinople lasted till a.d. 1261, when the city was surrinded by the Mohammedans. Baldwin escaped and survived the event about fourteen years. The principal western historian of this transient Latin empire is Villhardouin, one of the leaders in the capture of Constantinople.

The Greek writers will be noticed when speaking of the authorities for the contemporary Greek emperors of Nice.

Greek Emperors of Nicea or Nice.

(1204.) Theodoreus II. Lascaris (Theodoreus Lascaris, P. C.), in an active reign of eighteen years, re-established the Eastern Empire in a portion of its ancient Asiatic territory, of which Nicea was made the capital. He had married Anna, daughter of Alexius III. Angelus or Comnenus.

(1222.) Joaniss III. Ducas Vatatzes succeeded Theodoreus Lascaris by virtue of his marriage with Irene, daughter of Theodore Lascaris, or rather by his merit, which induced the Latins to accept him as a brother. His prudence and valour gradually extended his dominion, until he had recovered nearly all that the Latins had conquered in Asia and Thrace, except Constantinople itself. He crushed the Latins in the Grecian war (a.d. 1244), and drove the Nicene Greeks out of Asia Minor, and recovered a portion of territory from the Greek empire of Trebizond. He died a.d. 1255.

(1255.) Theodoreus II. Lascaris, son of John III., succeeded his father, and died after a reign of four years.

(1259.) Ioannes IV. Lascaris, a minor, son of Theodore II., succeeded, but he was soon virtually and afterwards openly deposed, and then blinded by Michael Palaeologus, first emperor of the family of the Palaeologus, and first of the restored Greek emperors of Constantinople.

The historians of this period are Georgius Acropolites; whose history has not comprehended the period when the sense of the empire was at Nicea (a.d. 1204-1291); Nicephorus Gregoras, whose history begins at the same point but comes down later than that of Acropolites; and the Metrical Chronicle of Ephraeminis, which begins in the year 1261. The history of Nicecis Choniates comprehends only a year or two after the capture of Constantinople by the Latins.

Restoration of the Sept of the Eastern or Greek Empire to Constantinople.

Family of the Palaeologus.

(1290.) Michael VIII., Palaeologus, or more fully Palaeologus, Michael Palaeologus, of Alexius III., ascended the throne as the colgte of the boy Emperor Ioannes IV. In 1261 Constantinople was recaptured by Alexius Stratelates, and Michael restored the
seat of government to that city. But if the Latins were ex- 
expelled, the empire never recovered the extent which it had 
before the Latin conquest, and had been dismembered on the 
west and east by the empire of Trebizond and the despotic 
of Epirus; though the despot of Epirus had, in the reign of 
Joannes V, been driven from power. It also lost many parts 
under the late Latin principalities remained in Greece, 
notably the Duchy of Athens, which continued till the 
time of Manuel II. [ATHENS, P. C., vol. iii. p. 19.] The im-
portance of Palaeologus, to the extent of which many noted 
parties in the state were finally separated from the empire by the Venetians or other western 
powers: Cyprus had been previously lost in the reign of 
the weak Isaac II. Lesbos, Chios, and Rhodes were however 
recovered by the Latins, when the Venetians, who had 
encouraged the Venetians, Pisans, and other Latins engaged 
in commerce or manufactures to remain at Constantinople, 
or in the suburbs, and established a Genoese colony in the 
sewer. Its guild in binding and healing the 
unhappy colleague Joannes was punished by Arsenius, 
patriarch of Constantinople, with excommunication; and 
the retaliatory measure of the deposition of Arsenius led 
to serious schism in the church of nearly fifty years' duration. 
A hyperclical union with the Latin church, ratified at the 
Council of Lyon, a.d. 1274, augmented the religious troubles of the Greeks, though it averted the threatened attempts to re-
establish the Latin throne of Constantinople. Michael died 
a.d. 1283.

(1283.) ANDRONICUS III. PALAEOLOGUS, or more fully 
DUCS COMMERVS ANGELVS PALAEOLOGUS, distinguished as 
the Younger, succeeded his father Michael VIII. and reversing the policy 
which Michael had pursued, dissolved the hollow solid of the churches and was excommunicated by the Pope (a.d. 1207.) His reign is marked by the establishment in Asia Minor (about a.d. 1300) of the rising monarchy of the 
Osmans, or Ottoman Turks, so called from Osman their founder, in place of the declining kingdom of the Seljuks, which had been left in Constantinople by the Crusaders. A native of Persia, the descendants of Zenghis or Genghis Khan. [TURKEY, TURKS, P. C., vol. xvi. p. 365.] The devastations of the remaining Asiatic provinces of the 
Eastern Empire by the Ottomans was repelled by some 
Catalan and other mercenaries under Roger de Flor, whose 
assassination, under order of Andronicus, in consequence of the disasters occasioned by him and his men, led to intestine war, 
which was at length ended by the retreat and establishment 
of the Catalans in the Duchy of Athens. The closing years of 
the reign of Andronicus were clouded by another intestine 
war or succession of wars between himself and his grandson 
and colleague Andronicus III. (a.d. 1292-1328), who obliged 
the old emperor to abdicate. Andronicus died four years after 
his abdication (a.d. 1329.)

(1329.) ANDRONICUS III. PALAELOGUS, or more fully 
DUCS COMMERVS ANGELVS PALAELOGUS, distinguished as 
the Younger, succeeded on the abdication of his grandfather. 
He was defeated by the Catalans of Athens, and by the Turks, 
who captured the city in 1347, and restored it to the empire. 
In Asia Minor, Rhodes, after a short period of virtual inde-
pendence, had been occupied by the Knights of St. John of 
Jerusalem [HOMPHALLER, P. C., in the reign of Andronicus 
the Elder. Andronicus III. died a.d. 1341.

(1341.) JOANNE VII. PALAELOGUS, called by some 
JOANNE PALAELOGUS I., and (1342) JOANNE VI. CANT-
ASCHEUS, or more fully ANGELOUS COMMERVS PALAE-
LOGUS CANTASCHEUS, and so called, was the son of his monarch, 
by whom his father's name is pronounced; and was 
ascertainment of his power and his condemnation to death drove him to rebellion, and 
he was crowned as Andronicus a.d. 1342. A civil war, in which 
the empire was divided between the two sons of the late 
empire of Andronicus III. The overthrow of Cantacuzenus's power 
and his death was occasioned by the.PNG

(1355), and his retirement to a monastery, where he 
employed himself in writing a history of his own time from 
a.d. 1321 to 1387) and where he died. From the abdication 
of Andronicus III the empire began the actual reign of Joannes Palaeologus, which was marked by the extension of the power of the Turks in Europe, and their capture of Adrianople (a.d. 1361), which they made their capital. They first gained a permanent footing on the European side of the Dardanelles in a.d. 1354, during the second civil war between Cantacuzenus, by capturing the castle of Tymbre, now Chini or Jemene, 
by the Egyptians, and near Gallipoli. [TURKEY, TURKS, P. C., vol. xvi. p. 365.] Andronicus died a.d. 1391, and his empire was divided among his son Palaeologus, the immediately adjacent parts of Thrace, and 
and some parts of Macedonia, Northern Greece, and the 
Mora, hastened into the west to solicit aid from the Pope and 
the west to obtain which he had to the Roman Church; but he not only failed in his purpose, and was arrested for debt at Venice. Released by the interve-
nestion of his son Manuel, despots of Thessalonica, he returned 
home, where he had to suppress a revolt of his son, Andronicus (a.d. 1385), who was taken prisoner and condemned to lose his sight. The operation of blinding was not effectually 
performed, and Andronicus escaped and imprisoned father, 
but was obliged to release him. He obtained, however, the 
cession of a portion of Thrace, which was formed into the 
principality of Selymbria. Joannes Palaeologus died, 
after an unhappy reign, in a.d. 1390 or 1391.

(1391.) MANUEL II. PALAELOGUS, who succeeded his father, 
Joannes V., during whose life he had shared both the name 
and exercise of sovereignty. He was attacked by the Turks, 
and by his brother Andronicus, prince of Selymbria; but made a 
peace with them in 1391, for which he was left in Constantinople, if not co-emperor; and visited Italy, France, England, and Germany (a.d. 1400-1402), to solicit aid against the Turks. 
Bajazet, the Turkish sultan [BAJAZET I., P. C.], meanwhile 
threatened the overthrow of Constantinople and the extinction 
of the empire, which was saved rather by the opportune 
abduction of Timour or Tamerlane [TURKISH, P. C.] over 
the Turks at Angora, and the captivity of Bajazet (a.d. 1402), 
than by Latin aid. Manuel was finally obliged to the empire the whole of the Morea. He died a.d. 1425.

(1425.) JOANNE VII., PALAELOGUS, surnamed PAPYRRO-
GENETUS or PAPPYROGENETUS sometimes called JOANNE 
PAPYRROGENETUS I., succeeded his father Manuel, and followed 
the same policy of seeking aid from the west, to conciliate 
which he brought about the hollow union of the Greek and 
Latin churches at the council of Florence, a.d. 1438, 
and to be present at which, he visited Italy. He ruled 
personally in Constantinople: the fragments of the empire in 
the Morea and in the Tauric Chersonnes, the Crimes, were ruled by his brothers as his vassals. His reign precipitated the down-
fall of the empire, for his project of union with the Latin 
church disgusted his subjects; the allies secured by him were defeated by the Turks at Varna a.d. 1444 [MURAT, I., 
P. C.], and the Turks attacked the Morea and allowed its ruler, 
Constantine, the empire's brother-in-law, to shift the 

(1448.) CONSTANTINE XIII. (some call him XII.) PALAE-
LOGUS, succeeded his brother, and a league of the Venetians 
succeeded his brother Joannes VII. He resigned his pos-
sessions in the Morea to his brothers Demetrius and Thomas. 
His brief reign was ended by the capture of Constantinople 
by the Turkish Sultan Mahomet II. a.d. 1453. Constantinople fell bravely in the defence of his capital, and the empire of the 
East fell with him: its dismembered portions were subdued by 
the ambitious and powerful Mahomet a few years after, 
except such as were occupied by the stronger hand of the 
Latins. Demetrius and Thomas Palaeologus were expelled 
from the Morea in or soon after a.d. 1460; the empire of 
Trebizond was extinguished in a.d. 1464, and all the value 
of Scanderbeg [SCANDERBEG, P. C.] was preserved. [SANDERBEG, P. C.], a.d. 1467, did not prevent the final subjugation of Epirus. [MIMOHIT, P. C.]

Thus were extinguished the name and the last remains of the empire. But the events that passed from 1261 to 1453 had it had subsisted for twenty-two centuries; from the settlement of the empire by Augustus nearly fifteen centuries; a duration as yet unmatched in the history of the world, unless it be in China. From the year 476 to 1204 the empire was the first constant line in the history of the world, and its power was by the 
perilous service was hardly interrupted though the seat of empire was temporarily fixed at Nice. The despotic character
of the government, if it prevented the growth of that national spirit and character which really constitute the strength and prosperity of a nation, yet prevented the dissolution of the empire, which presents amid frequent disasters a remarkable cohesiveness and unity, until the Latin conquest in A.D. 1204. But despite the decay of the old character of the empire depended on the personal character of its rulers, its history exhibits alternations of decline and recovery according as the personal worth of one or another of the character of vigor and activity; but each instance of the recovery generally fell short of its predecessors. During the temporary fluctuations of the condition of the empire, the tide of its greatness was gradually rolling back. Theodorich the Great died in possession of the whole extent of the empire both in the east and west. Justinian recovered only a portion of the latter. Heraclius saved the empire from extinction at the hands of the Persians, and effectively crushed their power; but he did not recover what had been taken by the Lombards in the west, and Africa and Palestine, which were wrested from his successors by the Saracens, were never recovered. The revival effected in the Macedonian period by Basil I., Nicephorus, John Tricones, and Basil II., fell short of that of Heraclius; and that of the earlier Comneni fell short of the success of the Macedonian princes. The fall of Lecanis and Messe, never more than a fragment of the empire of the Comneni, grew less and less until its extinction by the Turks. Yet this fragment preserved the name of the Roman Empire, which it has transmitted to the modern imperial state of Solomon in Rum-Illy in Europe, the last seat of the Byzantine Empire (Rom.-It., P. C.), and Rüm or Rumän, in Asia Minor, the seat of the empire of Trebizond. The last and most precious remnant of the empire is contained in the 'Roman History,' or rather 'Romaic History,' of Nicephorus Gregorius (from A.D. 1204 to 1351); in the history of the emperors (from Michael Palaeologus to Andronicus the Elder) of Gregory Panourgus; in the life of the Emperor John Cantacuzenus, containing the account of his own time; in the 'Historia Byzantina' of Ducas, especially including the reigns of the two Emperors, V. and VI., and the period to 1462; in the Chronicles or Annals of Georgius Phrantzes or Phrantz, from the recovery of Constantine in 1261 to A.D. 1477; and in the History of the Turks by Laonicos Chalcocondyles. We do not mention the contemporary Latin historians whose works include notices of Byzantine history; and of modern historians we only mention Ducas, L. Beato, with his continuator Ameibison, and Gibbon. Much valuable information is contained in the articles on the Byzantine Emperors and other eminent personages connected with the Eastern Empire, chiefly written by Dr. Plate in Dr. Smith's Dictionary of Greek and Roman Biography, by Dr. Winckler's Die Geschichte des Romischen Kaiserthums, and with all its admirable qualities, is unsatisfactory as a history of the Eastern Empire. The unity which it has given to his episodes has destroyed that of his main subject; and as he provides for his different parts of his story in the various portions which constitute the history of a reign or period. The empire itself is forgotten while we follow his absorbing narratives of the migrations of the Huns, the conquests of the Saracens or Moslems, and the vicissitudes of the Crusades; and the Byzantine history, interesting and important as it is, is yet to be written in a form suitable for the English reader.

ROMANIELLI, GIOVANNI FRANCESCO, was born at Viterbo in 1617. He studied a short time at Demerichino, but he is chiefly known as the scholar of Pietro da Cortona; and he was one of the principal managers of his works. He was from one of the best families in Rome, and was the son of Carlo Maratta and the school of Sacchi; and even to Pietro Cortona himself. Romanelli's picture of the Deposition, in the church of Sant' Ambrogio della Massa, gave him a temporary name above all his rivals. His picture of Pietro da Cortona to paint a picture for the same church, his San Stefano, which, when it was hung up in its place, so far eclipsed the picture of Romanelli that Bernini himself observed that it was easy to see who was the master and who the scholar. Romanelli showed more deliberation of execution but considerably less power than Cortona. There is a Presentation in the Temple in one of the rooms of the Vatican, and the workmanship, from a picture by Romanelli which is in the church of the Certosa. He was twice in Paris with his patron Cardinal Barberini, and he died at Viterbo in 1683, when about to set out with his family upon a third visit to that capital. There is a large copy of Guido's Triumph of Bacchus at Hampton-Court, by Romanelli. (Pascoli, Vie de Pittores sc. Moderni; Lancisi, Storia Pittorica, &c.)

ROMANIA ANDREAS and BERNHARD, eminent German composers, were the eldest sons of brothers who enjoyed a considerable share of reputation as instrumental performers during the middle and latter part of the last century. Andreas was born at Osnabruck in 1677; Bernhard in 1770. Both held appointments in the royal chapel of the Elector of Cologne, at Bonn, about the year 1708. The former began a great reputation on the violin; the latter as an almost unrivalled player on the violoncello; and both by their compositions, even at that early period of their career. The progress of the French armies at the commencement of the revolutionary war drove the two cousins to Hamburg, where their talents immediately procured them engagements. In 1795 they settled in Paris, and visited many parts of Germany and Italy, establishing their reputation, wherever they presented themselves, as professors of the first class. They returned to Hamburg in 1797, where the elder remained; but the younger left that city two years after, and proceeded alone through England and Spain to Lisbon, where he obtained a good situation in the royal chapel at Berlin. Andreas in the meantime turned his attention more exclusively to composition, and produced four operas; he also set Schiller's Ode to Music. For the church of St. Dominick in Paris; Roumth with another friend for four voices, and a pater Noster for three, besides many psalms. For the chamber or concert-room he composed much music, Schiller's Song of the Bell (Das Lied von der Glocke) and other things, which the Parisian noisemakers in every part of Europe. He also produced two full operas, Die Grossmuth des Scipio (The Magnanimity of Scipio), and Die Räumten von Palermo (The Ruins of Palermo), the drama of the latter from Mrs. Radcliffe's Italian; and, if an opinion of the work may be formed from a pianoforte arrangement, it seems to be an opera that might succeed in the fashionable theatrical theatres.

Bernhard, while in Berlin, wrote two magnificent and much instrumental music, particularly for the violoncello. Both cousins indeed were for a time chiefly known as authors by their compositions for their respective instruments. Their posthumous fame is mainly attributable to their symphonies and overtures, the best of which have become familiar to the amateurs of this country by the admirable performance of them at the concerts of the Philharmonic Society.

Andreas Romberg died in 1821, and leaving a family in embarras circumstances, a concert for their benefit was generously got up in London by the Philharmonic Society, which was conducted by Mr. Davis and Mr. D'Albert, and in whichpointed one of the professors at the Conservatoire de Musique at Paris, in 1801, and created Chevalier of the Legion of Honour, but retired from the office two years after. He came to London in 1803, and, after various visits of this country, gave a concert, by which he was not a greater, either in purse or reputation; for impropriety, not to say presumptuously, fixing his tickets of admission at a guinea, his auditors were few, and his own performance too wild, he announced either the decay of his powers, or that he had not kept pace with others in the improvements of his art. He died in 1841.

(Romantisches Lexicon; Harmonicum, vol. i.)

ROMISH CHURCH. An account has been elsewhere given [Patriarch, P. C., vol. xii. p. 317] of the rise and nature of the patriarchal dignity. It may be added to what has already been said, that the patriarchal dignity in the fifth century was occasioned by the erection of the bishopric of Jerusalem (which had previously been subordinate to the archbishopric of Caesarea) into a patriarchate. It is a curious indication of the little difference that actually supplied to superior antiquity and apostolic origin, that the Christian Church first established, and which enjoyed, at its origin, a supreme position, not of one only of the apostles, but of all, was the last that received ecclesiastical rank; and hardly ever were its patriarchs enabled to compete in power and influence with their fellows of Rome or Constantinople. We here give a table of the patriarchs down to the capture of Constantinople and the overthrow of the Eastern Empire, A.D. 1453. We give the occupants of the patriarchate seen from the time of their asserted foundation, with the date of the
accession of the respective bishops or patriarchs, according to the generally received computation; but we may observe that the succession of the earlier bishops is very obscure, and that the asserted apostolic foundation of the several churches (with the exception of Jerusalem) is quite destitute of Scriptural support, and has been vehemently disputed: not to speak of the question as to whether the government of the primitive Church was, in the modern sense of the word, episcopal or not. The bishops of Constantinople, who was bishop in the early part of the fourth century, are especially doubtful.

In the fourth century the succession is perplexed by the schism occasioned by the Arian controversy; and from the sixth century, owing to the Jacobite schism, there has been a double succession in the patriarchates of Alexandria (the Jacobite patriarchs of which are sometimes, from their nation, called the Coptic patriarchs) and Antioch: and the perplexity in the patriarchate of Antioch has been occasionally increased by the rivalry of contending Jacobites, as in the schisms of the thirteenth, fourteenth, and fifteenth centuries. After the conquest of Palestine and the greater part of Syria, by the first crusaders, and the capture of Constantinople in the fourth crusade, the confusion was made still greater by the appointment of Latin patriarchs at Antioch, Jerusalem, and Constantinople. In order to prevent mistake, we give in Roman letter the prelates who were regarded by the Greek government and church as the legitimate holders of the see, without regard to the orthodox or heterodox of their opinions individually: the Jacobite prelates are given in italics, and the Latin patriarchs of the East in small capitals. We give the names in the usual Latin form, which has, in most cases, continued in use in English books; the few cases in which the names have been Anglicized are not, as the reader will easily recognize John in Joannes, Peter in Petrus, Mark in Marcus, Theodore in Theodorus, &c.

The list of the popes given elsewhere [For*, P. C., vol. v. p. 405] is restricted here for the sake of comparing dates, &c. The chief authorities employed by us are Le Quien, Oriens Christianus; Fabricius, Bibliotheca Graeca, vol. vi, vili, xii, xiv, ed rec, viii, xi, xii, ed Harold; the Practica Præcipuorum, given in the Acta Sanctorum of the Bollandists; Maii, vol. iii, July, vol. iv, Augusti, vol. i; Bandurius, Imperium Orientalis, vol. i, p. 167, &c.; and L'Art de Vérifier les Dates, the dates of the popes in Fabricius are generally taken from the Acta Sanctorum, so that these two authorities are, in most cases, identical.

When two years not consecutive are assigned as the date of accession, it must be understood that the year of accession is not agreed upon, but that it occurred either in the earlier years, or in the interval between them. Dates at the end of a name show that the person named was patriarch in that year or in those years, but that the year of accession is unknown. A, subjoined to a name, denotes Arian; M, Monothelite; Ic, Iconoclast; J, Jacobite, or Monophysite; H, Heretic (reputed), without reference to the nature of his heresy.

* It is very doubtful if there were more Popes than one of the name of Clitus or Anacletus at this early period; and whether, if there was only one, he is to be placed before or after Clemens I.

† This See was deposed by the Arcans, to whose doctrine he was extremely opposed, and died in exile. A party of his adherents broke off from the church and formed a sect which existed for some time under the name of Rustikhana.

‡ Most of the authorities give the bishops between Onesimus and Olympius in the following order; and omit the length of each episcopate, which, as given above, is evidently too great, as may be seen by adding them together.

§ In L'Art de Vérifier les Dates, the three prelates next preceding Metropolitans are thus given:
A.D. 329, Libanus. During his exile Pelagius was set as papal vicar, and is on
that account sometimes enumerated among the Popes as Pelagius II., which
causes a difference in the numbering of later Popes of that name.

357, Paulus II. Lactis (restored), A.

358, Cyprian I. Lactis I. (restored), A.

359. Pelagius I. Lactis II. (restored), A.

360, Petrus II. Lactis I. (restored), A.

361, Theophilus I. Lactis II. (restored), A.

362. Sixtus II. Lactis III. (restored), A.

363, Leo I., Magnus, or the Great.

401, Hilarius

402, Simplicius

403, Felix II. (or III.)

404, Gelasius I.

405, Anacletus II. (or III.)

406, Dionysius I.

407, Sixtus III. Lactis IV. (or V.)

408, Bonifacius II. Lactis V. (or VI.)

409, Simplicius, anti-pope for a

410, Sylvester I. Lactis VI. (or VII.)

411, Pons I. Lactis VII. (or VIII.)

412, Vigilius, against Liberius.

413, Vigilius. Vigilius had been anti-pope for a time when

414, Anacletus III. (or iv.)

415, Sylvester I.

416, Fabianus I. Lactis VIII. (or IX.)

417, Sixtus III. Lactis IX. (or X.)

418. Theodosius I. Lactis X. (or XI.)

419, Joannes I. Lactis XI. (or XII.)

420, Joannes II. Lactis XII. (or XIII.)

421, Joannes III. Lactis XIII. (or XIV.)

422, Joannes IV. Lactis XIV. (or XV.)

423, Joannes V. Lactis XV. (or XVI.)

424, Martinus I. Lactis XVI. (or XVII.)

425, Eugenius I. Lactis XVII. (or XVIII.)

426, Lusius I. Lactis XVIII. (or XIX.)

427, Vitalianus I. Lactis XIX. (or XX.)

428, Donatus I. Lactis XX. (or XXI.)

429, Donatus II. Lactis XXI. (or XXII.)

430, Symmachus I. Lactis XXII. (or XXIII.)

431, Symmachus II. Lactis XXIII. (or XXIV.)

432, Agapetus I. Lactis XXIV. (or XXV.)

433, Leo II. Lactis XXV. (or XXVI.)

434, Simplicius II. Lactis XXVI. (or XXVII.)

435, Joannes V. (or III.) Lactis XXVII. (or XXVIII.)

436, Conon Lactis XXVIII. (or XXIX.)

437. Theodosius, anti-pope for a

438, Pons III. Lactis XXIX. (or XXX.)

439, Conon Lactis XXX. (or XXXI.)

440. Lactis Rebellii contra

441, Felix III. Lactis XXXI. (or XXXII.)

442, Leo III. Lactis XXXII. (or XXXIII.)

443, Simplicius I. Lactis XXXIII. (or XXXIV.)

444, Leo II. Lactis XXXIV. (or XXXV.)

445, Simplicius II. Lactis XXXV. (or XXXVI.)

446, Symmachus I. Lactis XXXVI. (or XXXVII.)

447, Symmachus II. Lactis XXXVII. (or XXXVIII.)

448, Agapetus II. Lactis XXXVIII. (or XXXIX.)

449, Leo II. Lactis XXXIX. (or XL.)

450, Simplicius I. Lactis XL. (or XLI.)

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452, Leo II. Lactis XLII. (or XLIII.)

453, Leo III. Lactis XLIII. (or XLIV.)

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458, Simplicius II. Lactis XLVIII. (or XLIX.)

459, Leo II. Lactis XLIX. (or L.)

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464, Simplicius II. Lactis LIV. (or LV.)

465, Leo II. Lactis LV. (or LX.)

466, Simplicius I. Lactis LX. (or LXI.)

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470, Simplicius II. Lactis LXIV. (or LXV.)

471, Leo II. Lactis LXV. (or LXVI.)

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474, Leo II. Lactis LXVIII. (or LXIX.)

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495, Leo II. Lactis LXXXIX. (or XC.)

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Note: The table above shows a list of events with their respective years. The events are listed in chronological order from 1920 to 1928.
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ROPES, RIGIDITY OF. [RIGIDITY OF ROPE, P.C.S.] ROSAL/LINA. [FORAMINIFERA, P. C. S.]

ROSELLI, COSIMO, a celebrated old Florentine painter, was born at Florence, according to Gaye, in 1498. There are few of his works remaining; the principal is the fresco in the convent of Sant' Ambrogio, at Florence, painted in 1465, according to an inscription seen upon it by Rumohr, when Cosimo cannot have been more than eighteen years of age according to the above date: Vasari however says it was painted in his youth. And Rumohr observes that Cosimo, in the commencement of his career, followed the path which was marked by Angelo da Firenze and Masaccio; but that after a few brilliant examples of his ability, he left the approximation of the representation of things as they really appear, to follow an uninteresting, inane, and ugly manner. The fresco represents the transportation of a miraculous-working chaflie from the church of Sant' Ambrogio to the episcopal palace; the abbess and monks follow in the procession, and at the palace-gate is a group of priests and choristers ready to receive it: around is a crowd of curious spectators. The story is told, and the picture described, in Richa's 'Chiese di Firenze.' The picture has been engraved by Lainino for his series of old Florentine paintings, and there is a group from it in Lusi's 'Ettria Pittrici.'

Cosimo was one of the painters invited by Pope Sixtus IV. to Rome to paint the Cappella Sistina, built in 1475, by Baccio Battisti [Piantelli, P. C. S.], for that pope. Cosimo's paintings in this chapel are still in good preservation; there are—the Destruction of Pharaoh's Host in the Red Sea, in which the Israelites are also represented returning thanks for their deliverance; Moses receiving the Tables of the Law while the Israelites are without possessing the golden calf; the Sermon on the Mount, and the healing of the Leper; and the Last Supper. The landscape of the third picture was painted by Cosimo's pupil, the eccentric Fierio Cosimo, afterwards the master of Andrea del Sarto. These works were painted for a prize in competition with others in the same chapel by Sandro Botticelli, Domenico Ghirlandajo, Don Bartolomeo, Luca da Cortona, and Pietro Perugino. Cosimo was very anxious to get the prize, but he doubted his ability; at the same time that he had little faith in the pope's judgment; he therefore, knowing his weakness in composition and design, painted his picture very high in colour, and used plenty of ultramarine and gold, aiming to attract upon the pope's fancy by his gay display. When the pictures were all uncovered, his fellow painters laughed at Cosimo for his pomposity. Cosimo however proved himself a good man of the world, if not a good painter; his gay works fixed the pope's attention and he obtained the prize; the other painters were censured by his holiness for not using finer colours, and they were obliged to retouch them and heighten their effect in the same manner, to the great triumph of Cosimo, whose works however were in reality inferior to all the others.

Cosimo Roselli was still living in 1506: Vasari says he was sixty-eight years old when he died; if therefore we were born in 1459, 1507 may have been the year of his death. He was the master of Frabartolomeo. (Vasari, Vita de' Pittori, etc., ed. Schorn; Rumohr, Italiensche Forschungen; Flatter and Bunsen, Beschreibung der Stadt Rom, vol. ii., Pt. 1; Gaye, Carteggio intorno d'Artdt, vol. ii., ap. 1.)

ROSELLINI, IPPOLOTO, Cavaliere, was born August 13, 1800, at Fies. His father was a merchant, and Rosellini himself was designed for his father's business; but he acquired such a love of the study of antiquities from his first tutor, Padre Battini, a Servitiant monk of St. Antonio, who was a tolerable numismatist, that he commenced at an early age to give himself up to those studies for which he afterwards distinguished himself, and the mercantile career was wholly abandoned. In 1821 he finished his university studies in Fies, and took the degree of Doctor of Theology. He afterwards studied the Oriental languages for three years with the celebrated (now Cardinal) Mezzofanti at Bologna; and
in 1824 he was appointed professor of Oriental languages in the university of Pisa. In 1825 he appears to have devoted himself to the study of Egyptian hieroglyphics, following the steps of Champollion, of whose discoveries he was an ardent advocate. When Champollion, in 1826, for the further development of his system, examined the Egyptian monuments in Rome, Rosellini, by the permission of the Tuscan government, attended him in his researches; and he accompanied him to Paris, and there spent the autumn of that year in similar researches: he published in the same year "Epigrafi Egiziane" in the gallery degl' Uffizi at Florence.

In the autumn of 1827 the Grand Duke Leopold II. granted Rosellini a year and a half leave of absence, and he founded five companions upon a similar expedition at the same time, and they all embarked together at Toulon, July 31, 1828, and landed on the 18th of August following in Egypt, where they remained fifteen months, exploring all the principal monuments of Egypt and Nubia.

Rosellini arrived at Pisa January 6, 1830, and commenced immediately a course of lectures on the Egyptian hieroglyphics, the subject of which is in "Le Elements Linguistici Epygrafsici" of Padre Ungarelli, published at Rome, in 1837. Rosellini had himself made his principles known in a letter to M. Peyron, in 1831. The great results of the expedition however were not to be derived by Chauchand and Rosellini; the former undertaking to explain all the historical monuments, and Rosellini the civil and religious. This design was however rendered impossible by the death of Champollion, which took place March 6, 1832, and Rosellini expressed his sincere regret and disappointment in a epistle on his death, which he published under the following title—"Tratto di ricorrenza ed amore alla memoria di Champollion." Rosellini was thus compelled to undertake the whole work himself, which was his original design, and the prospectus explaining the plan of the work had already appeared in January, 1831. Accordingly in November, 1832, appeared the first volume of "I Monumenti dell' Egitto e della Nubia," by Rosellini alone, explaining the historical monuments; the second appeared in 1833; and by 1836 three more, explaining civil monuments, were published; but between the publication of the fifth and sixth volumes a long interval occurred, partly through Rosellini's appointment as librarian of the university of Pisa, but chiefly through a serious illness which he was afflicted in the chest, and which incapacitated him for nearly two years. At the same time, with the above volumes of letter-press, appeared two large folios of illustrations, the historical monuments in 1832, and the civil monuments in 1834. The historical monuments was completed in 1838-41, in two volumes, the third being divided into two parts, making in all four volumes in five on the historical, and three on the civil monuments, and these were published during Rosellini's lifetime.

The remaining part were the religious monuments of the Egyptians, which he was occupied upon until the period of his death, and though he did not live to see the publication, he completed a MS of this part.

In 1830 he gave up the professorship of Oriental languages and commenced a series of archaeological lectures; but in 1841 these labours were remitted him on account of his extremely bad health, and in 1843, he might be supposed a time that he might descend to study to the completion of his great work on Egypt. On the 16th of May, 1843, however, his case was serious, and he died on the 18th of May following, in his forty-third year. The third part of the work was published in 1844, under the direction of the professors Bonani and Severi, in one volume of illustrations and one volume of text.

This great work on Egypt, yet unrivalled as a review of Egyptian art and customs, though in a scientific-literary view it treats only upon the threshold of Egyptian history and antiquities, is briefly described in "I Monumenti dell' Egitto e della Nubia" di Scipione Sciapola, published at Rome, in 1844, one volume, with four volumes of text, 1832-41; the second, Rosellini, contains the civil monuments, "I Monumenti Civili," in 156 plates, with three volumes of text, 1834-46; the third, containing the religious monuments, "I Monumenti Religiosi," in 175 plates, with four volumes of text, 1832-46; the second, Rosellini, contains the civil monuments, "I Monumenti Civili," in 156 plates, with three volumes of text, 1834-46; the third, containing the religious monuments, "I Monumenti Religiosi," in 175 plates, with four volumes of text, 1832-46. An index of the whole work is said to be in preparation by Rosellini's pupil Giuseppe Bernardi, who published a short Life of Rosellini at Florence in 1845—'Biografia del Professore Ippolito Rosellini,' of which an abstract appeared in the "Allgemeine Zeitung" and in the "Kunstzeitung," and is still in print; and which has been used in the biographical portion of this article. Rosellini bequeathed his Egyptian MSS. to the university of Pisa; the drawings and plates are all the property of the Grand Duke. Among the MSS. is a voluminous but unfinished "Dizionario Geroglifico," Hieroglyphic Dictionary, with several thousand names.

ROSHAN is a small tract, and a part of that immense region of Central Asia which is called Turan or Independent Turkestan. It lies between 37° and 38° N. lat., and between 70° and 72° E. long., but its extent is not well known, as the country has never been visited by Europeans. It is a very mountainous country, with valleys and ravines of all kinds of which constitute the western declivity of the Bolor Tagh, and surround the elevated table-land of Pamir. Along its southern boundary runs the river Oxus, which in these regions is called the Media, and it cannot be crossed for the greater part of the year. This circumstance, and the great quantity of snow which covers the higher portions of the mountains for nine or ten months, render the country almost inaccessible except after several months of summer, and in the month of January, when the river, notwithstanding its rapidity, is frozen over in many places. The cultivation of grain is limited to wheat and barley; several kinds of fruits are much cultivated, such as melons and mulberry-tree is much cultivated, and the fruit is used for making flour. Horses are numerous: the camel with two hunches is the principal beast of burden. Caravans travel both through the desert and the mountains. The inhabitants, whose number is not stated to exceed a thousand families, speak a peculiar language. The sovereign of this country is dependent on the khan of Kunduz, but this dependence is only nominal.

(Wood, Journey to the Source of the River Oxus.)

Rosienni, Carlo De', born in 1787 at Rovereto, in the Italian Tyrol, studied at Innsbruck, and then in his native town, where he began early to show his aptitude for literary composition by writing several dissertations on poetry. He afterwards removed to Ferrara, where he published in 1803 a collection of 789 auctoribus. In his "Istituzioni" were added a letter by Vannetti on the style and the language of Ovid, and a parallel between the Orpheus of Ovid and the same character in Virgil. This work obtained for Rosmini the patronage of the most honorable citizens of the Florentine academy. He next wrote: 'Della Vita di L. Annone Seneca libri quattro,' Rovereto, 1793. In 1801 he wrote an account of Vittorio da Feltre, a celebrated preceptor of the fifteenth century, and of his system of education: 'Idea dell' ottimo F cicredore nella Vita e Disciplina di Vittorio da Feltre e de suoi Discopoli.' This book may be called a treatise on pedagogy, as well as the next work published by Rosmini on Guarino Veronese, a contemporary of Vittorio da Feltre, and upon his school: 'Vita e Disciplina di Guarino Veronese e de' suoi Discopoli,' 3 vols. 8vo, Brescia, 1805-6. In 1808 Rosmini published an carries on the learned Filosofo: 'Vita di Francesco Filippo da Tolentino,' 3 vols. 8vo. His next work was a Life of Trivulzio, a great captain of the sixteenth century: 'Dell' Istorior intorne alle Milizie Imprese di Francesco Trivulzio detto il Magno Libri XV.,' 2 vols. 4to., 1816, a biography enriched with handsome engravings and valuable documents. The last work of Rosmini was his history of Milan: 'Dell' Istorior intorne alle Milizie Imprese di Milano,' 3 vols. 8vo., 1816. This history is very valuable, as it gives an account of the reign of Frederic Barbareossa down to 1555, when Milan was annexed to the dominions of Charles V. The author wrote a continuation of it down to the beginning of the reign of Charles Emmanuel III., but was prevented from finishing it. Rosmini ranks among the principal Italian biographers of their time. He died at Milan in 1827.
Rossi, Rosso De', or Il Rosso, called in France, Maître Roos, a celebrated Florentine painter, was born in Florence in 1496. He studied the works of Michael Angelo, and his style is the figure of a dying sultan; Victory is abroad with him with a laurel. Lord Rodney's monument is a pyramidal group, the statue of the admiral forming the apex; below is Fame communicating with History.

Art-Union Fund; Companion to St. Paul's Cathedral.

Rota/Lia. [Fontainel, P. C. S.] The most abundant genus of the Foraminiferal order, in the Cretaceous system of strata. Many of his works have been engraved. (Vasari, Vita de' Pittori, etc.; Lettere Pittoriche; D'Argenville, Vies des Peintres.)

CLEMENS FELIX, B.A., was born at Nottingham in 1762; his father, a native of Siena, though not a licensed practitioner, practised as a medical man at Nottingham. Young Rosso was apprenticed very early to a sculptor, and his extraordinary precocity was so marked that after he had served his time, a journeyman, at eighteen shillings per week, but being employed by his master to correct some work on which Lucchetta's principal assistants had been engaged, he suspected that his own abilities were of a superior class, and he demanded and obtained higher wages. It was now, however, having once felt the longings for praise, impossible for him to remain in his then subordinate situation, and he determined to seek his fortune elsewhere. He arrived in London. There, still a boy, he entered himself as a student of the Royal Academy; and in 1781 he obtained the silver medal, and in 1784 the gold one, which entitled him to three years' maintenance at Rome. He went to Rome in 1785; in 1788 he returned to London; in 1800 he was elected an associate of the academy; and only two years afterwards, a very short interval, he was elected an academician. He was subsequently appointed sculptor to the Prince Regent, and he was employed in decorating Buckingham Palace. He was afterwards sculptor to William IV. But he had little to do after the completion of his great public monuments in St. Paul's Cathedral, and he determined to quit his situation, and retire to Florence upon a pension from the Royal Academy. He died February 21, 1839. He was twice married, and had eight children by each wife.

Rossi was both a classical and a monumental sculptor, and his style was manly and vigorous, especially in his monumental works, but they are not remarkable for any refinement either of sentiment or of sentiment. Of the first class the following may be mentioned:—A Mercury in marble, executed in Rome; a recumbent figure of Eve, in marble; Edwin and Eleanor; Celadon and Amelia; Messidor; Zephyrus and Aurora; and Venus and Cupid. A statue of Thomson the poet by him is in the possession of Sir Robert Peel; and there is a large colossal statue of Britannia on the Exchange at Liverpool. His best works, however, and those by which he is and will be known, are the following monuments in St. Paul's Cathedral:—The Marquis Cornwallis, the navel; Captain Faulkner and Lord Heathfield, in the south transept; and Captains Mose and Roux, and Lord Rodney, in the north transept. The subjects of these are all officers of Lord Cornwallis, Heathfield, and Rodney, and Captain Faulkner: all of which, except the second, are groups of three of more figures of the heroic size. That to Lord Cornwallis is placed opposite that of the Duke of Wellington, and is in a similar style of composition and on a similar scale, it is a pyramidal group, the Marquis, as a Knight of the Garter, on a pedestal forming the apex; below are three allegorical figures—Britain, Victory, and Fame—standing before a castellated rock to crown a warrior on the sea-shore with laurels.
In 1840 the Baden government re-admitted him as a lay benedictine. He retired to Freiburg in 1843; after a serious illness, rendered worse through the moral sufferings he had been exposed to, Rotteck died on the 20th of November, 1840. His death was mourned as a public calamity in all Germany.

The principal work of Rotteck is his 'Allgemeine Weltgeschichte' mentioned above, which extends from the commencement of authentic history to 1815. It went through fifteen editions, the last with a continuation down to the years from 1815 to 1840, by K. H. Horns, Brunswick, 1841-45, 11 vols. 8vo., of which nine are the work of Rotteck, and the two last the continuation of Hermann. No general history is capable of such splendour and of such production of Rotteck; in Germany it is in the hands of almost every educated family; its fame soon spread over Europe and America; and it was consequently translated into most of the European languages. The English translation by T. Jones, Philadelphia, 1840-42, four vols. 8vo., 2nd edition, London, 1842, is however only a translation of an extract of the 'General History,' which Rotteck published under the title 'Aszam der Weltgeschichte,' Freiburg, 1831, &c. four vols. 8vo. Contrary to the practice of most German historians, Rotteck simply relates history, indulging neither in critical investigation of trifles, nor in metaphysical contemplation of the broad facts of history. But the whole is represented from a liberal point of view, and enlivened by sound reflections on the origin of freedom and slavery, and the causes of the rise and fall of nations. The style of Rotteck is clear and attractive, but sometimes a little too much interrupted; and every page shows that the author possessed that rare taste and that discretion which enable a man to distinguish between trifles that are important facts, and to give neither too much nor too little. The reader wishes to obtain a strong impression of the peculiar merits of this work, as the production of a German historian, need only compare it with Ham- mene's far-famed History of the Turkish Empire. Among the other works of Rotteck we mention 'Kleine Schriften' (Minor Works), five vols. 8vo., 1829-1835, which contain a great number of valuable memoirs, essays, letters, &c., on various historical and metaphysical subjects, 'Lehren der Vaterlandesrechte und der Staatswissenschaften' (Doctrine of Law as a Metaphysical Science, and of Public and Constitutional Law), four vols. 8vo., 1820, &c.; 'Staatsrecht der Constitutio-

ROVERE, DELLA, the name of a noble family originally from Savona, in the territory of Genoa, which gave to the church two celebrated Popes [Sixtus IV. and Julius II., P. C.] besides many cardinals and other distinguished persons. Pope Julius II. caused his nephew Francesco Maria Della Rovere to be adopted by Guidobaldo of Montefeltro, Duke of Urbino, who was childless, as his successor in the duchy. Accordingly, after the death of Guidobaldo in 1507, Fras-

Guidobaldo died in 1574, and was succeeded by his son Guidobaldo, who, as described above, had been from the times of the Montefeltro family, a favourite resort of men of science and of literature. Francesco Maria I. had been a patron to the celebrated naturalist Aldo-

RUBRUQUIS, WILLIAM DE. This distinguished traveller of the middle ages, was a friar of the Minorite Franciscan order. Pits, or Pitacus, an English Catholic of the sixteenth century, in his curious biographical work—

'Vives de los Reyes, Bisbes, Apóstolico Men, and Writers of England,' claims him as a Christian, and as one that did honour to his country. It appears, however, pretty plainly that he was a native of Brabant. His real name was Royalbrock, or Hybruck, which, according to the fashion of the time, in Low German, means a river. It is possible that his birth is not preserved, but he was probably born about the year 1288. He entered the cloisters early in life, and soon after completing his noviciate and taking the major vows, he went to the Holy Land, with other orders of the cloister. The recent successes of the fourth grand crusade under Louis IX. of France, afterwards crowned as Saint Louis, had revived the hopes of the Christian states, which streams of pilgrims were flowing thither; and some of these couples upon setting up their tabernacle of rest in Jerusalem, and upon finding provision and settlement for life in the Holy Land.

But before Rubruquis could reach the Syrian shore these hopes were overtaken; the devout French king had been defeated near Tunis, rather by endemic diseases than by the.
sward of the Saracen, and had been made prisoner, with the
remnant of his host, by the Mohammedans. Louis, however,
was soon released upon paying a ransom, and entering into
a treaty with the Selden; and he was in Palestine in 1253.
Although some monkish reports had been sent in quest of that great, undiscoverable, Christian potentate of
the East, Prester, or Priest John, had returned disappoint-
ment, and with very discouraging accounts of the difficul-
ties and perils of their journey, King Louis could not dis-
charge his imagination of that visionary personage; and being
more anxious than ever to contract an alliance with that fan-
catic chief, he determined to make his own search of him.
A report had reached Louis that the great Tartar, Sartach, son of Bautu-Khan, who commanded in the
western parts of Tartary, was a good Christian. If this
Sartach were converted, Prester John said, the Christian
world, if truly reported, must make him a valuable ally to the
Christians who were warring in the Holy Land against the
Peyrims. The mission of Louis was, therefore, to find that
Tartar prince, wherever he might be, and at whatsoever
toll and danger. It was composed of Rubruquis, friar Bartholom-
ew of Cremona, and a certain friar Andrew, whose country
or birthplace is not named. Rubruquis, though the youngest
of the three, appears to have been considered as the head of
the mission. His, no doubt, owed this pre-eminence to his
superior scholarship, wit, and courage. Before his departure
King Louis strictly enjoined him to write down everything he
heard or saw that was of importance, but at the same time
obeying the royal order, and by making a good use of his
eyes (his ignorance of the Tartar languages made his ears of
less account), he brought back a great deal of curious informa-
tion, which has given much light to our knowledge of the
quaint journey. After spending a short time at Constantinople among
the Greek Christians, whose schism gave them great offence,
Rubruquis and his companions took ship, and entered the
Euphrates or Black Sea. But in the month of April 1254, they
were safely landed at Solida, now Soudack or Soujak, in the Crimene,
not far from Cherson, where Howard the philanthropist died
in 1796. But here their troubles began. They had brought
not even a tunic to entertain themselves with, or to carry
ports all through the East. They were told that they
would never get at Sartach unless they had rich gifts to lay at
his feet. They, however, pleaded their vow of poverty, as
Franciscans, and boldly went on, travelling sometimes in
carts, and sometimes on rough horses. They crossed the
Steppes which separate the Dnieper or Boryzhenes, from
the river Don, or Tanais, and then directed their course due
east, over immense desert plains where nothing was to be
seen but earth and sky, and here and there the barrows or
tumuli of the Comans. On the 22nd of July, being in a
fruitless condition, they reached the banks of the Don, where
they found some fish, but not enough to eat them. On the
12th August, the river they plunged again into the hungry desert. On
the 2nd of August they reached the temporary residence or en-
closure of the Khans. As they had nothing to give,
beyond a little sweet wine, a few preserved meats, and
big full of sweet biscuits, their reception was of the sorriest.
They soon discovered that Sartach's Christianity was all a
dream. That Prester chief, however, determined to send
them on to his father Bautu. From his encampment they
did not continue their journey until they came to Mashch-Khan, the father of the Khan, who had previously been
found somewhere in the direction of China. Of this long
journey of hunger and thirst, cold and fatigue, there was no
end. At last, on the 27th of December, the poor monks arrived
at the encampment of the Khan, who was living in a
bark crossed a lofty range of mountains, and had travelled
due north. The emperor was attended by many Chinese manda-
rians, and by ambassadors from India, from Persia, and from
Traveller, by the court of a state, if he had not drunk on cosmic, or the fermented
milk of mares. On the 5th of January (1254) the friars were presented at
court, where they had to perform several humiliating ceremonies.

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which province the family of Rufio had large estates, and excercised considerable local influence. The queen approved of the plan, however hazardous it might appear, and made the king an offer of 200,000 ducats on the first day of his rank of his salute. Rufio, glad to escape from the intrigues and vexations of the court of Palermo, accepted the offer. In February, 1799, he crossed over in a boat with only five men and three passengers. He landed at Baghara, a seat of his family. He collected a number of adherents, and unfurling the royal flag with a white cross, proclaimed a crusade against the French and their partisans. The inhabitants of Naples had committed many acts of oppression in the provinces, and had exasperated the rustic population, which were not ripe for the change from old absolutism to a republican form of government. The Calabrians, emboldened by thousands to Rufio's standard, marched against the town of Monteolone, which surrendered by capitulation, as well as Catanzaro; it afterwards stormed Cetrone, which was given up to plunder; took Cosenza though the treaty of its commander; and thus in less than a month Rufio was master of all Calabria, where he re-established the king's government. He was joined by many regular officers and soldiers, and was supplied with artillery. He then took the road to Apulia, and laid siege to Altamura, which opposed his passage. The inhabitants defended themselves despairingly, but the town was taken and plundered for three days, and the inhabitants were massacred. The Aragonese, in other parts of Apulia hoisted the royal flag; the Abruzzi was already in open revolt against the republicans of Naples, who were soon after abandoned by the French troops, which were in the middle of May, led by General Bertinetti, receiving the order to oppose the Austrians and Russians, who were predominant in that quarter. Naples was left to its fate with only a small French parron in one of the castles. On the other side Rufio was joined by some regular Russian and Albanian forces from Corfu. He then advanced towards Naples by Avellino, and surrounded the capital at the head of from fifty to sixty thousand men, mostly irregulars. After some fighting outside of the town, an insurrection of the lower orders from within facilitated the entrance of Rufio's bands, and the town became a scene of carnage; but the republicans still defended themselves in the castles and the adjacent districts, where they had fortified the massive palaces and houses. Rufio, willing to spare further destruction, entered into a convention with the republicans, who were to be spared off for France. The convention was signed by him, and a part of the republicans were actually sent off to France, when King Ferdinand arrived from Sicily the bay, at the end of June, on board the English admiral Nelson's ship, and refused to sanction the capitulation. Rufio had exceed all powers in treachery of rebels, and he appointed a special court to try the republicans, many of whom, chiefly of the higher orders of society, were put to death. The minister Acton charged Rufio with the executions, and the court on his request for the Jacobin and the cardinal, disappointed and humiliated, seized the opportunity of leaving Naples for the concile, which had been summoned to assemble at Venice for the election of a pope. Rufio was made Prefect of the Annona, a post he held for the next four years, until his departure from Naples in 1783. He then returned to Rome, where he remained till 1809, when he went to France and made his peace with Napoleon, and he was one of the Cardinals who sanctioned by his presence his second marriage. In 1814 he rejoined Pope Pius VII. at Rome. After a time he returned to Naples, and took again his seat in the council, where he displayed a marked moderation of sentiments. He went to Rome in 1823 to the conclave in which Leo XII. was elected, and died at Naples in 1837 at an advanced age.

Rufio was a man of ability and accomplishments. He was worldly and lax in principles, by no means fanatical or even pious, in which regard his other romantic expedition of 1790 cannot be justly attributed to him, although he may be blamed for not reckoning on them before he put himself at the head of the insurrectionary movement. The republicans of Naples had assumed a task beyond their strength; they mistook their own coterie for the nation, and they suffered cruelly for it, for the people were not on their side. The same error has been repeated again and again in other countries. There is a group of books, published by Knight & Co. in 1837.

Contemporary with this Rufio, there was another Cardinal Rufio, who was a nephew of the first, and the head of the branch of the same family, who was archbishop of Naples.

(Petroni, Storia della Spedizione del Cardinale Rufio; Colletta, Storia del Regime di Napoli; Coppi, Annali d'Italia.)

RUFIO, a celebrated German battle painter, was born at Augsburg in 1666. He was the pupil of Caspar Fischbach, an eminent historical painter in his time; but Rufio devoted himself at an early age almost exclusively to battle painting, in which he was partly confirmed by the admirable battle-pieces of Bourgignon, Lebbeke, and Tempesta, which he studied on his journey to Vienna and Frankfort. He was invited by the Fleming Schilder-Bent, or Society of Painters, in which he was received, from his predilection for battle painting, under the nickname of Schild: all the members of this society were known by surnames.

In 1795, after an absence of five years, he returned to Augsburg, and had the opportunity of witnessing its siege in 1708, and of thus studying from nature what he had hitherto only acquired from his imagination and from the pictures of others. He lost a great portion of his property through this siege, but what he lost in substance he gained by excellent opportunities he found of perfecting himself in the line of art which he had adopted, and he acquired extraordinary excellence as a battle painter; and became distinguished also for his etchings of battles and skirmishes: he excelled in the manner in which he represented smoke, and made use of it in separating and arranging his groups. There is or was a large picture of the siege of Augsburg in the Stetten collection at Augsburg. Rufengas was made director of the Academy of Augsburg in 1710; he died at Augsburg in 1742. His pictures are very numerous, and there are not many collections without one or more examples of his style. He painted besides battles and skirmishes, horse-markets, and horse-trade, and his being a haberdasher enabled him to put his pictures on a larger scale. His design is vigorous and bold, but his colouring is unequal, sometimes being high and warm, and at others heavy and monotonous: and though his light and shade is often well disposed, yet the expressions which they are intended to give are often too black and obscure. Owing to an illness he painted many years with his left hand. There is a picture of the battle of Blenheim by Rufengas. He was the ancestor of a numerous family of battle painters, of whom the most famous was son of him by J. C. Füssli was published, together with a Life of Kupetzky, by the same writer: Leben Georg Philipp Rusch und G. Johann Kupetzky; Zürich, 1746.

Christian Rufengas, his second son, engraved about sixty of his father's designs in a very spirited manner, chiefly in mezzotinto. His original etchings, of which there are about thirty, are much prized.

RUISCH, RACHEL, a distinguished Dutch flower-painter, was born at Amsterdam in 1664: she was the daughter of Professor Ruisch, who had taught flower-painting by himself. He was the painter of his two sons, and the father of the Elector of the Palatinate, and of the present Elector of Hesse, who was one of the chief members of his family. In 1695 she married to the portrait-painter Juriaen Pool, who was two years her junior, to whom she bore ten children and with whom she lived fifty years. In 1701 she and her husband were elected members of the Society of Painters of Amsterdam, and in 1792 she was elected the elector of the Palatinate, appointed her his court painter. She died at Amsterdam in 1760, aged eighty-six, and she continued to paint till she was upwards of eighty years old. Her works include a portrait of The Elector of Hesse, the Elector of De Heem, and have sometimes been sold for very high prices, even 8,500 francs for a single picture.

(Van Gool, Nijmegeen Schouburg der Nederlandsche Kunst-schilders; Waddington, Dictionary of Painters, in those times still called Lijnen, Geschichte der Vaterländische Schilderschun, etc.)
RULER, PARALLEL. A good form of this instrument is explained in Marquoz's Rulers, P. C. S., which is particularly applicable to the case in which numerous and related parallel lines are wanted in the same space. The ordinary parallel instruments are of two kinds, which might well be called parallel rulers and parallel rollers.

The principle of the common parallel ruler is a parallogram of equal sides, with its sides and angles altered, the other side changes position, it and its parallel always remaining parallel to the first side and its parallels. Two rectangular rulers are connected by two crossbars of equal length, and are connected in such a manner that the four pivots, two in each ruler, shall be the four points of a parallogram. The line joining two pivots on either side is always parallel to the length of the ruler. One ruler being held fixed, and a line drawn with the edge of the other ruler in any position, then any motion given to the other ruler by the rotation of the crossbars gives, on the edge of the moving ruler, a line parallel to the first line. The defects of this construction are, that the four pivots may not make an accurate parallogram, in which case the instrument is worthless: and the sides of the two rulers, when the instrument is closed, may not be parallel to one another, in which case all the lines must always be taken off the same ruler. Moreover, one ruler remaining fixed, there is but a small command of distance from it; so that, to get at much space, the process of first moving the line which has to be advanced, the second brought up to it, the first ruler advanced again, and so on. Now, owing to the rotation of the pivots, this gives an oblique motion to the instrument; so that it is not certain that what is required is gained, the point through which it is to be drawn is off the ruler. To meet this disadvantage, and to give the instrument a more extent, three rulers are sometimes put together, each connected with the next by cross-bars in such manner that the cross-bars connecting the first and second have an opposite revolution to those connecting the second and third. At its best however this instrument is rather clumsy; but, such as it is, it is safe and easy to learn, and will make good work when well learned.

The simplest kind of roller is the common round roller, which, with a little practice, will draw parallels for ordinary use very well. It is good practice in the use of instruments to draw parallels in this way; the ruler being held in the middle and gently allowed to take its own rolling motion. If a ring be well drawn round the ruler, it is good practice in drawing perpendiculars to adjust the ruler so that the ring may roll over the line to which perpendiculars are to be drawn. But a roller which is more easily used is sold in all the shops. It consists of an ordinary roller of rectangular form, either of which are bored and divided into equal parts, and the side of the roller being in inches and twelfths; the inch divisions being made to come exactly opposite each other. A roller is set into room cut out of the line of the ruler in such manner as to project a very little way from the roller, the line of the roller being of inches. When the instrument is put down on the paper, either of the bored edges may be brought down on the paper, or both may be carried down. The metal body, which is also called a roller (to which are fixed cylinders, the middle part being in a frame) rolls easily, and additional stability is given if, while it rolls, one of the bored edges be kept slightly upon the paper. The ends of the rollers are graduated and a fixed index is in the frame, so that by allowing equal numbers of divisions to pass the index at each roll, a good approximation (though not quite with a draughtsman's accuracy) may be made to equidistant parallels. Perpendiculars to a given line are drawn by adjusting the ruler so that opposite divisions of the bored edges may travel on the given line. With a very little practice this is an instrument of great power and accuracy. Before using it, draw a line with it, roll it away, and then roll it again to that line, and see if the coincidence is as perfect as before. Various other modes of trial will suggest themselves: indeed no one should use a parallel ruler at all until he has done this a sufficient number of times, and satisfied himself that he can get the opposite sides quite equal.

A rough construction of this kind is now (very recently, September, 1840) sold under the title of 'Schleicheng's Parallel-Roller.' It is a metal box, bored in a flat bored roller, so as to carry it when it rolls. This is meant to rule lines for writing, but it may be made to do good service as a parallel ruler for other work.

ROUMOH, CARL FRIEDRICH LUDWIG FELIX, VON a distinguished writer on art, was born of an old family...
"... were followed, in 1637, by a treatise, 'Zur Geschichte und Theorie der Formschneidekunst.'"

"In 1837 he made a fourth journey into Italy, but he did not go to Rome. This too was a tour with political views, not as an artist. He published an account of his journey at Lübeck in 1838, under the following title: — 'Reise durch die östlichen Bundesstaaten in die Lombardie und die italienische Schweiz, etc.' He died of consumption in Lübeck, in 1838, in the forty-ninth year of his age. His name — Ueber die Beiläufigkeit der Colonen im Neuen Toccana, aus den Urdenken — Hamburg, 1830. In 1841, however, after a fifth visit to Italy, to Venice, in the previous year, he returned to his more genial subject the history of art, and published in Leipzig an inquiry into the invention attributed to Flängeur of printing with engraved plates on damp paper—Untersuchung, dass Maso di Flangeur Erfinder des handgeschweifter Metallplaten auf getrocknetes Papier abzurudern. This was his last labour in the history of art, and his last poetic production of this class was — Raphaels Lehr-und-Wanderjahre.

In 1841 he purchased a house in Lübeck intending to end his days there, and he fitted it up according to his own fancy. The winter of 1842 he spent in Berlin, and he was then attacked with the consumption. The class — he was removed in the spring to Lübeck, where his physician recommended him to visit the baths in Bohemia; he accordingly set out, but being too ill to proceed he remained at Dresden, where he died of apoplexy in July, 1842, in the sixty-fourth year of his age.

Rumohr's last literary production was a preface to — Kampf Demokratischer und Aristokratischer Principien zu Anfang des sechszehnten Jahrhunderts, Lübeck, 1843. It is a translation from three papers presented to him by Professor Ahlmeier of Brussels. His 'Italienische Forschungen' will remain as a monument of his judgment and industry when probably nearly all his other works are forgotten. It is one of the best documentary works in the literature of art, and at the same time abounds in critical and theoretical reflections; it is likewise a work of great interest, though there may be different opinions about the correctness of Rumohr's theories. The two first volumes are upon modern art in Italy generally, from its origin to its decline in the 16th century, which is distributed under fourteen distinct heads; many errors in Vasari are corrected; much obscurity of the 12th, 13th, 14th, and 15th centuries is cleared up by authentic documents; and various false notions concerning the development of art are dissipated by critical reflections: the third volume is under two heads only, which treat chiefly of Raphael, and the architecture of the 15th and 16th ages.

(Kunstblatt, 1844.)

RUNCIMAN, ALEXANDER, an eminent Scotch painter, was born at Edinburgh in 1724. His father was a weaver, and he made coloured sketches in the fields as early as his twelfth year. At the age of fourteen he was placed in the studio of Johann Christoph, John being compelled sometimes to work as a farmer and an independent landscape painter. When only nineteen years of age he set up as an independent landscape painter in Edinburgh, but it seems the people of Edinburgh, like those of the other places, though lavish of their praise were very cautious in their purchases, and Runciman had the gratification of dwelling on his own pictures, for they were left on his hands. This state of affairs continued for about five years, when in 1749, for the first time he exhibited his pictures in Edinburgh, and though he had more ability for this line of art his fortune seemed to have been very little if at all improved. In 1756 he visited Italy, and at Rome made the acquaintance of Fuseli. Their tastes in art were very similar: both were absorbed by what is termed the sublime, and both were alike wild and extravagant in their execution. 'They were,' says Allan Cunningham, 'rivals in that unbridled licence of imagination, which introduced an air of irresponsible and considerate extravagance into the sublimest and stornest subjects on which they employed their pencil.' Runciman remained five years in Rome, and when he returned home he carried with him a knowledge of the introduction in which he had been living, the following passage: 'I send this by the hands of Runciman, whom I am sure you will like: he is one of the best of us here.'

He arrived at Edinburgh in 1771, a fortunate time for him, for Parravilion, the director of the new academy of the arts which had been established at Edinburgh in 1769, had very recently died, and Runciman was appointed to fill his place, with a salary of 120l. per annum, than a sufficient income in those days. He was considered one of the most original of his time, and was patronized by Sir John Clerk, of Penicuik, and Robert Alexander, an Edinburgh merchant. The former employed him on a great work at Penicuik, suggested by himself, neither more nor less than the whole of Scotland. The work comprised with twelve great compositions from Macpherson's Ossian, which at that time was believed in Scotland to be authentic.

The subjects are—Ossian singing to Malvina; The Valour of the proposed attack; The rigorous justice of the king; The time of Hunting of Catholda; The finding of Corban Carlops; Gobletosse mourning over Lamberg; Oina Morval; Cormac attacking the Spirit of the Waters; The death of Cormac; Scandinavian Witches making Incantations; and Finnegans engaging the Spirit of Loda. The picture of Agonacea is reckoned the best.

One cannot but respect the enthusiasm of the painter of such a series as this, but as works of art they are extravagant in treatment and in composition, and incorrect in design. While engaged in this work Runciman painted also — The Ascension — on the ceiling over the altar of the episcopal chapel in the Cowgate of Edinburgh. He painted also — King Lear; Andromeda; Nausicaa and her Nymphs surprised at the Water Side by Ulysses; and Agrippina landing with the Ashes of Germanicus.

Runciman died in Edinburgh in the year 1772 and exhibited some picture there, but all that is remembered of him, says Allan Cunningham, is that he took up his quarters with the widow of Hoghurst, who was in those days reduced to let lodgings for fourpence a head. Runciman died suddenly of a fit of apoplexy, West Nicholson street, October 21, 1785, in his forty-ninth year. He had contracted an illness while painting the Penicuick cupola, being forced to lie much on his back, and to this is attributed the shortness of his life.

Runciman's best works are his sketches; his faults are only multiplied in his pictures. The most offensive of his peculiarities of design is his huge length and uniformity of limb, the glaring defects also of the works of Fuseli; he was also invariably extravagant in his attitudes, and was conventional, mannered, and unnatural in his draperies. Indeed, to the precise and academic taste, the works of Runciman will, says Allan Cunningham, be ranked among the crude attempts of arrogant immobility. In execution he was least defective in his colouring, but in composition he was ever ready, and his invention was grand and fertile. There are few etchings by him from his own designs; the best is considered — Siggurna weeping over the Heart of Tancred.

He is said to have been lively and agreeable in conversation; Hume, Robertson, Lord Kames, and Monboodho were among his associates.

(Contribution of Eminent Scotch Painters, &c.)
after whom he engraved, besides some others, an excellent plate of Jupiter and Leda; he also etched some plates after Ondry while at Paris, illustrating the fables of Fontaine.

Soon after his return to England Ryland was appointed engraver to George I and was made a companion of the Royal Academy in 1743. He engraved two portraits of George III. after Ramsay, and one of Queen Charlotte holding the Princess Royal on her lap after Cotes; it was one of Cotes's principal works. 'It is very clear,' says Sir Robert Smirke, 'that Ryland was a very considerable engraver, and that he had a just claim to a place in the annals of art.' Among his engravings, which were numerous and varied, were a number of portraits, landscapes, and historical scenes.

Ryland's life was one of hard work and continuous effort. He was a prolific engraver and produced a large number of works during his career. His work was highly regarded and he was recognized for his contributions to the art of engraving. He was a member of the Royal Academy and received several honors and awards throughout his career.

Ryland's work was widely circulated and his engravings were sold in many cities and countries. He was successful in maintaining a steady income from his work, and his engravings were highly sought after by collectors and art lovers.

Ryland's engravings were not only of high quality, but they were also highly detailed and accurately reproduced. He was able to capture the essence of the original paintings and create works that were true to the original art. His engravings were highly sought after and were considered to be some of the finest in the world.

Ryland's work was highly respected and he was considered to be one of the leading engravers of his time. He was a man of great accomplishment and his contributions to the art of engraving will be remembered for many years to come.
St. Francis, St. Cecilia, and Chastity burning the Arms of Cupid, by Guercino; Bathsheba, by Boucher; Jacob persuaded to send Benjamin with his Brethren into Egypt, by Van der Vaart; Cellini; Pyramus and Thisbe, by Rembrandt. Besides these there are drawings by the following masters:—Baccio Bandinelli, Battista Fiastra, Perino del Vaga, Bernini, Andrea Sacchi, Stefano della Bella, Bolognetti, Giuseppe Palma, the younger, Giorgio Massimiani, Cam. Proccaci, An. Carracci, Schidone, F. Mola, Eliz. Sirani, L. Cambiaso, S. Rosa, Jan Breugel, and P. Wouwerman. He engaged for the design of a plaster statue, for P. d'Arcontas, Van- den-Crijper, Boucher, Ramsay, J. B. Oudry, and others.

RYSBRACK, MICHAEL. The date of the birth and the birth-place of this distinguished Flemish sculptor are different. He was born at Lubeck, or Bonn, where his father, a road-cutter, published the 'Century of Drawings,' &c., who was well acquainted with him, states that he was born at Antwerp June 24, 1693. He was the son of the landscape-painter Pieter Rysbrack, who, after he had given his son some instruction in design, placed him in 1706 with the sculptor Michael Vander Vorst, with whom he remained six years.

In 1720 Rysbrack came to London and distinguished himself for his small models in clay. He was the first sculptor who was extensively employed in England, and he spread a general taste for the art over the country by his fine monumental works. His progress in London was at first slow, and he found a contracted notion of the art in the north of England. He was for some time engaged with Gibbs, who contracted with the original parties for monuments, for which he, on his part, contracted with Rysbrack, greatly to his own advantage. When Gibbs received the Lord Oxford monument 100L, each for the statues on Prior's monument in the south transept (or Poet's Corner) in Westminster Abbey, while he gave Rysbrack only 50L each. Rysbrack, however, soon became aware of his own merits and shook off all dependence on Gibbs. Engagements crowded upon him, and there was not a work of sculpture of any consequence undertaken in England that was not entrusted to Rysbrack. When men found, says Walpole, that there was a sufficient supply of fine statues, the taste for monuments was much improved and greatly spread. 'Our monuments until Rysbrack's time,' says the same writer, 'had depended more on masonry and marbles than on statuary. Gothic tombs owed their chief grandeur to rich canopies, fretwork, and abundance of small niches and trifling figures. Bishops in cumbent attitudes and cross-legged Tompalls adored no grace not required any. In the reigns of Queen Elizabeth and King James I. a single figure reclining at length on the elbow in robes or serjeant's gown, was commonly overwhelmed and surrounded by diminutive pillars and obelisks of various marbles; and if particularly sumptuous, of alabaster girt. Gibbs, in the Duke of Newcastle's monument in the Abbey, seems to have had an eye to that kind of tasteless taste. From the reign of Charles I. and the Commonwealth, all things of framing charge generally satisfied the piety of families. Bird indeed bestowed busts and bas-reliefs on those he decorated, but Sir Cloudesley Shovel's, and other monuments by him, made men a taste of such honours.' ('The abilities of Rysbrack,' continues Walpole, 'taught the age to depend on statuary for its best ornaments, and though he was too fond of pyramids for back-grounds, his figures are well disposed, simple, and great.'

Rysbrack, unlike most of the artists of his age, studied exclusively nature and the antique; he had no respect for the works of his great countryman Rubens, and those of Rembrandt he would not look at. In which he was of course attacked wholly by the feelings of a sculptor, form and character being his exclusive study. He was a most industrious sculptor. Fine works are to be seen by him in many parts of France, in St. Petersburg, in Wembly Palace, at Stourhead, and at Bristol. In a few sculptors' workshops there has been more activity than was there in those of Rysbrack in Veres-street, Oxford-street, during about forty years of the height of his art. The poet, though entirely through his successful rivals Scheemaker and Roubiliac, his occupation sensibly diminished.

Rysbrack's busts were very numerous, and include those of all the great men of his day. His first great public work was the bronze equestrian statue of William III., which was made for the city of Bristol, and erected in Queen's Square in 1733. Scheemaker also competed for this statue, and his model was thought so much better than Rysbrack's, that 50L. was rejected for the design of Rysbrack, who received 3000l. for it; Walpole says 1800l. The monument to Sir Isaac Newton in Westminster Abbey, which was executed in 1735, was of a design by Kent. One to Mrs. Oldfield, in the cloisters, in the year before, was apparently his first independent monument in the Abbey.

In 1739 he finished a colossal statue of George II. for the parade of Greenwich Hospital, at the expense of Sir John Jennings, the then governor: it was cut out of a single block of marble weighing eleven tons, which had been captured from the French at Blenheim. In 1741 he finished the statue of George II., which was in the old Royal Exchange, London. He obtained however more reputation by his monument to John Duke of Marlborough and his duchess in the chapel at Blenheim; and among the distinguished letters Rogers, who died young, supported by Fame and History; in the lower part is a baso-relievo of the surrender of Marshal Tallard. At Blenheim also, in the library, is a beautiful marble statue of Queen Anne; it was erected in 1726.

In Christ Church College, Oxford, there is a statue of Locke by Rysbrack, which is in the 'Oxford Guide' erroneously attributed to Roubiliac; it was made in 1787. This college contains also some busts of distinguished members by Rysbrack. Besides what have been already mentioned there are the following monuments by him in Westminster Abbey:—

To Admiral Vernon, and Robert Kane, governor of Jamaica, in 1720, in the north aisle; to John Friend, M.D.; and John Methuen, in the south aisle; to Sir Godfrey Kneller, in the nave; to John Gay, Nicholas Rowe, John Milton, and Ben Jonson, in the south transept, near Poet's Corner; and one to Daniel Fultene in the cloisters.

The erection of Shakspeare's monument by Scheemaker, in Westminster Abbey, is said to have greatly obscured the reputation of Rysbrack: but it only stimulated the industry of this sculptor to make still greater exertions. This dread rivalry was the cause of his making his Palladio, Inigo Jones, and Fiammingo, at Chiswick, and subsequently his masterpiece, the Hercules, at Stonor Park, which is said to have cost several Gold Hours. This Hercules is a species of historical figure, a record of the English gymnasia or amphitheatre for boxing, an institution which was put an end to, as the principal gym- nasiasts generally ended their career by being hanged. The figure was made for Henry Hoare, Esq., who built a temple expressly for it. It is of the heroic size, seven feet high, and cost Rysbrack three years labour. The head is copied from the Farnese Hercules; the limbs are taken from several different English freemasons of this gymnastic amphitheatre. 'The arms,' says Walpole, 'were Broughton's; the breast a celebrated coachman's, a bruiser; and the legs were those of Ellis the painter, a great frequenter of that gymnasium.'

There are many other statues by Rysbrack—as a Flora, from the antique, at Stourhead; the Duke of Somerset, at the Duke of Buckingham's, and that of Bridgewater, at Richmond; the Duke of Granby and Lady Gurney; Charles Duke of Somerset and his Duchess, in Salisbury Cathedral; Sir Hans Sloane, in the botanical garden at Chelsea, and his bust in the British Mu- seum; Lady Folkestone, Colybut, Earl; Lady Beaufort, Derbig; the second, third, and fourth Dukes of Beaufort, at Badminton, Gloucestershire; Dr. Radcliffe, at Oxford; John Willet, Esq., Merly House, Dorsetshire; a statue of Charles I., for George Selwyn; and the following busts:—Pope, Gibbs, Sir Robert Walpole, Duke and Duchess of Argyle, Lord Bolingbroke, Wootton the landscape-painter, Martin Folkes, Ben Jonson, Butler, Milton, Cranwold, the heads in the Hermitage at Richmond, and those of the English Worthies in the Elysian Fields at Stowe: he made also a good bust of himself. Notwithstanding his industry, Rysbrack was not rich, and when at the age of seventy he gave up his pro- fession, his former friends failed him. Besides his remaining works and his collections of prints, pictures, drawings, marbles, casts, models, &c., including a large collection of his own drawings, which, says Walpole, were conceived and executed in seven years, and though they are hung in the adornment of the last three years of his life was in making such drawings in bistre, and many were sold at the two auctions of his effects which took place after his death. He died January 11, 1770.

('Rogers, Collection of Prints in imitation of Drawings, &c.; English Connoisseur; Walpole, Anecdotes of Painting, &c.; Smith, Nollekens and his Times, &c.'
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SABUNEA (named by De Candolle, in honour of Joseph Sabine, F.R.S., long time Secretary to the Horticultural Society of London), a genus of plants belonging to the natural order Leguminosae. It has a cup-shaped campasule with a truncate, nearly entire border, a papillose-coriaceous corolla, with an obn Johnston, rather shorter than the vexillum. The stamens are diadelphous, the free one and four others half as short as the rest. The style is filiform, glabrous, and is anastomosed with the stamens. The legume stipitate, compressed, linear, elongated, many-seeded, mucronate by the style. The species are unarmed West Indian shrubs, with abruptly pinnate leaves, smooth mucronate leaflets, and one-flowered fascicled pedicels.

S. floridea has its leaflets in 8 or 9 pairs, elliptic oblong, the flowers rising before the leaves. It is native of the American Islands of St. John, Krabben Island, and St. Thomas. The violet flowers are considered poisonous.

S. duchesii has its leaflets in 10-12 pairs, elliptic oblong, the flowers appearing after the leaves. It is native of Martinique and Porto Rico.

SACCHOLACTIC ACID. [Chemistry—Mucic Acid, P. C. S.]

SADAI. [SAADI, P. C.]

SAFEET-KALVE. [Zonax-Equus, P. C. S.]

SAGACIA, a genus of plants belonging to the coal-formation, (Brongniart.) It includes species ranked by Sternberg as Lepidodendron.

SAGENOCRINUS, a genus of fossil crinoids. (Asin.) Family of the Crinoids of Dudley.

SAGENOPTERIS, a genus of fossil ferns. (Prent.) It occurs in the shales of the Yorkshire coast, and includes part of class of Lycopodiaceae.

SAGRABA. [SPADA, P. C. S.]

SAHARUNPOOR, a district in the province of Delhi and presidency of Bengal, in Hindostan, formerly extended northward from the city of Delhi as far as the Sutlej, and which form the northern limit of the immense valley through which the Ganges flows. The Ganges and Jumna, north of the city of Delhi, run nearly parallel to each other at a distance of about 50 miles, and the district of Saharanpur occupied the doss, or flat space, between them. The soil of the whole of this space is exceedingly fertile, producing grain of all kinds, sugar, cotton, indigo, and tobacco. Madjeep or the Hindoo obtained possession of it in 1788, and it was held by the Hydriat till 1803, when it was given up to the British. In 1804 it was formed into two divisions, Northern Saharanpoor and Southern Saharanpoor, with a civil establishment for each; but the arrangement has been since modified, and the greater part of Southern Saharanpoor has been included in the district of Merut. Of the district of Merut, or Southern Saharanpoor as it is still sometimes called, the chief town is Merut, in 29° 55' N. lat., 75° 45' E. long. Of the district of Northern Saharanpoor the chief town is Saharanpur, in 29° 59' N. lat., 77° 35' E. long., and about 90 miles, direct distance, N. by E. from the city of Delhi.

(Sammlung, Gestalt Indian Geograph.)

SAILORS. [SAIT, P. C. S.; BRAMH, P. C. S.]

SAILORS. Accidents involving serious loss of life and property are continually occurring from the inability of ordinary sails to resist violent gusts of wind. The sails of a ship (Saiz, P. C. S, p. 281) usually consist of several widths of canvas sewn together side by side, with the seams arranged vertically; and the principal strength which they have to resist tearing arises from cords sewn along the edges of the sail. If these give way, or if from any accident a tear is commenced, the rupture frequently extends at once along the whole length of the canvas, and the sail is thereby, in neutral phrase, to turn into rubide. To provide a remedy for this formidable evil, Mr. Archibald Tait patented in 1844 an improved kind of sail, which, from their fitness to resist violent winds, he terms Storm-sails. These are made in the usual manner, and subsequently strengthened by sewing to their surface a number of canvas bands about an inch broad, with cords woven in them, such bands being secured at their ends into the boltropes, or cords forming the boundaries of the sail, and carried diagonally across the surface of the sail at an angle of 45° with the seams, and at a distance of about three feet from each other. Two sets of bands are used, crossing the sail in opposite directions, one set being attached on each side of the canvas, and the distance of the bands from each other is so adjusted with reference to the width of the canvas, that the points where the two sets cross each other may fall upon the vertical seams. By this simple contrivance the strain is so equalized as to render tearing less probable than with an ordinary sail; while, if any injury be inflicted, the rent is confined within the narrow limits of one of the diamond-shaped compartments into which the sail is divided by the principal bands. In ordinary cases it is proposed to apply these bands not to new sails, but to such as are half-worn; and the patentee states that such sails may be thus protected at one-fifth of their original cost. For sails of the same size a similar improvement in another direction is at present under the test of experience, have testified their hearty approval; and it is suggested by some that its adoption may lead to the use of lighter canvas than would be safe with sails of the ordinary variety. (Salter, P. C. S., p. 14.)
cient to make the extra cost of the protection only one-tenth instead of one-fifth.

SAINT GEORGE, SAINT MARY, SAINT MICHAEL, etc. (GEORGE, ST.; MARY, ST.; MICHAEL, ST.)

SAINT HILAIRE, GEOFFREY ETienne, was born at Etampes, in France, the 15th of April, 1772. He was destined by his father for the church, and received the appointment of a schoolmaster, but, however, sent to the college of Navarre, where Briason lectured on experimental philosophy, and under him he acquired a taste for the natural sciences. He first devoted himself to medicine, and, in 1795, became associated with Cuvier at Paris; he studied very diligently, and in 1798 was appointed subcurator and demonstrator of the Natural History cabinet, in the Jardin des Plantes. He was subsequently appointed professor of anatomy and physiology in the faculty of sciences in 1808. He was sent by the government on a scientific expedition to Portugal in 1808. In 1815 he was returned as a member of the Chamber of Deputies for his native city of Etampes. He died at Paris in July, 1828.

Geoffrey St. Hilaire was one of the most assiduous cultivators and ablest exponents of what is called philosophical anatomy. The idea on which this department of science was founded was that the parts of animals were developed and applied to zoology and comparative anatomy during the latter part of the last century. It was, however, amongst the rich collections of the Jardin des Plantes, and the activity and zeal of such men as Lamarck, Cuvier, Toumey, Dumas, Valencienne, Serres, and St. Hilaire, that it received its most important applications and its greatest development. The fundamental idea of this system is the unity of the composition of the parts of the animal. The result of this is that each unity is capable of expression in a few simple laws. What, in fact, might be predicated in botany of the various parts of a plant by a knowledge of the structure of the leaf, might, in the same manner, be applied to animals by a knowledge of certain fundamental parts of their organisation. Thus Geoffrey St. Hilaire, amongst his other labours, established the fact that the numerous leaves of the head of the fish, and by consequence those of the higher animals, were transformations of the simple vertebrae; and that the laws of development which applied to the one applied to the other.

These views, equally applicable to every organ of the body, were given by Geoffrey St. Hilaire, in a work published in 1818, entitled 'Philosophie Anatomique,' which was illustrated with an Atlas of folio plates. He also published several papers on the principles of the philosophical anatomy. In 1828 a small work appeared, as an introduction to the lectures delivered on natural history in the Jardin des Plantes on the principle of the unity of organic composition, with which he was connected, entitled 'Philosophie de l'Organisme,' 5vo. Although previous to the time of Geoffrey the morphological idea lying at the basis of philosophical anatomy had been applied to the explanation of the phenomena of abnormal forms of animals, just as it had been of plants, yet the subject had not been fully developed. In 1822 he published his great work on the anatomical philosophy of human beings. These beings, which had formerly been regarded as mere accountable freaks of nature, were now found to be the result of the action of fixed laws, and their various forms susceptible of the strictest classification. This work contained a new classification of monsters, with a description of the variations of their different forms; and a history of the various causes supposed to produce them. It also comprehended some new views on the nutrition of the fetus, and an accurate estimate of the phenomena attending the formation and growth of the embryo. It was the result of two years' labour, in which the author pointed out the fact of a unity of composition in the reproductive apparatus of the two sexes in birds and mammals.

St. Hilaire's work, in which St. Hilaire contributed to the various departments of natural history would be very long. There is scarcely a branch of zoology to which he did not successfully apply the great principles of his anatomical philosophy. Amongst the works published during the present century that do not bear testimony to the great influence he has exerted. At the same time the views held by the school, at the head of which Geoffroy St. Hilaire may be justly placed, have led to great controversy. Fully as Cuvier was impressed with the importance of Geoffroy's works, he opposed him in some of his conclusions, and this led to a controversy which developed, in these inquiries, a theological element. Geoffroy was convinced of final causes, as being in opposition to the theory of a unity of composition. In his philosophy he states that he knows nothing of 'intentions' or 'objects' in creation; and when he says that man is an animal he rejected that there were 'no animals which had a part to play in nature.' This controversy has recently, in this country, assumed a popular form; but it is obvious, from the use made by the supporters of the one side, as well as by the other, of the principles of the 'Anatomical Philosophy,' that this theory is not incompatible with their views.

A complete edition of the works of Geoffroy, has been published in France under the title of 'Professional Studies of a Naturalist,' in 42 volumes. Etienne Geoffroy St. Hilaire has left behind him a son, Lidore, now Professor of Zoology at Bordeaux, and formerly at Paris, who has successfully cultivated the favourite science of his father. A complete list of Etienne Geoffroy St. Hilaire's works will be found in Callisen's 'Medicinisch-Schriftenlektor Lexicon.'

SALENIA, a genus of Echinoidea, remarkably profuse of species in the forms of the echinoderm class. It was named by de Saules, de Francis, Saint, was born at the Castle of Sales, near Anneye, in Savoy, on 21st August, 1857. His parents, the Count and Countess de Sales, are described as having been of a religious and ascetic character. As a child he was placed under the care of the Jesuits. He soon became a proficient in rhetoric and philosophy, and, at the same time, he did not neglect those arts which are calculated to adorn an intercourse with society, though, in his formative years, he had obeyed the wishes of his father than to have followed his natural inclination. He remained in Paris till 1858, when he was sent to Padua to study civil law under Guay Fancourt. At Padua he formed strong attachments and made friends which increased into friendship, with the Jesuit Antonio Pasoevino, under whose spiritual direction he placed himself. His success at Padua exceeded the expectation of his friends, and, at the age of twenty-four, he left that university with a high reputation for learning and piety. He afterwards spent some time in Italy, and made a pilgrimage to Notre Dame of Loreto. On his return to his native country, he found that his father had obtained for him the appointment of Counsellor in the Senate of Chambery, and was desirous of uniting him with a rich heiress, whose fortune would enable him to enter the Church. The mind of Francis, for a long time directed towards theological pursuits, had however gradually acquired a disposition which could only be satisfied by an entire devotion to them, and he was anxious to enter the Church from his childhood to yield obedience to his father's wishes, he feared to make him acquainted with his desire. In this difficulty he consulted a relation, Louis de Sales, who was canon of the church of Geneva, and through his mediation the Count de Sales was induced to abandon his favourite project, and allowed his son to devote himself to the ministry of the church. After receiving the first orders he was permitted by the bishop to preach. The greatest success attended his first efforts in pulpit oratory. He possessed, indeed, all the qualities calculated to gain the attention of his hearers; a voice powerful and pleasing, an animated and persuasive action, and a ready wit and humour. He was himself deeply convinced of the truths he was advocating, were heightened in their effect by a strikingly handsome person and a mild and modest demeanour. In the fulfilment of his pastoral duties he was not less capable, and was able to the priesthood, with rather a childish expression, pleased at first sight; little children in their nurses' arms could not take their eyes off him. He was equally delighted with them, and would take his hands, and say, 'This is my little family. The children ran after him, and the mothers followed them.' (Michelet, 'Priests, Women, and Families, translated by Cocks.)

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We may now present him exercising these qualities in a larger sphere and applying them to the conversion of those who differed from him in religious faith. The better to understand the peculiarly difficult nature of the mission with which he was intrusted it will be necessary to give some account of the circumstances of the time. The city of Genoa, having pronounced the authority of its bishop and that of the Duke of Savoy; it was an independent republic and the stronghold of the Calvinistic party. It had become possessed of the antiestates due to Louis XIII., and the territories of Gex, Terni, and Gaillard; coincident with these changes was a substitution among the inhabitants of the creed of Calvin for the faith of Rome. In 1600, Charles Emmanuel Duke of Savoy, pretended to exercise this antiestates portion of his duchy, and his first care was to attempt to bring back the inhabitants to their former religion. (De Tho, Hist. Univ., 1. aee.) For this purpose he applied to the titular bishop of Geneva, Claude de Granier, to send missionaries over the conquered country. Francis de Sales, and his relation Louis, the canon of Geneva, were among the first to undertake an enterprise in the prosecution of which much opposition and some personal danger were to be apprehended.

On the 9th September, 1594, the two missionaries arrived at the frontiers of Chablais, where they dismissed their servants and equipages and determined to travel on foot, in order more easily to render themselves visible to the inhabitants of the town of Tomon, the capital of the Chablais (CHALILA, P. C.), which contained only seven Roman Catholics, was the first place in which they exercised their mission; the fruit of it may be seen in the fact that the town, the next year, under the name of Chablais, was attached to the church of the Exarch, in the church of St. Hippolytus in that town. But the most important object of this mission, in view was the conversion of the adherents of the Calvinistic party. To effect it he first solicited an interview with Theodore de Beza (BEZA, P. C.), who was then fast sinking under the weight of age and infirmities; several conferences took place between them at Geneva; and the result of them is very differently related according to the religious persuasion of the narrators. Whatever change however took place in the mind of Beza through this interview is none that Francis could possibly be accompanied by no public profession. Michelet, without however citing his authority, remarks, that the Roman Catholic missionary added to his spiritual inducements the weight of temporal advantages, and made an offer of a pension of 4,000 crowns if he would conform to his church.

On the return of Francis to Annecy, in 1596, he was appointed coadjutor to Claude de Granier, the bishop of Geneva, with the title of Bishop of Nîmes in perpetuity; this dignity he for a long time refused to accept, and only yielded on the earnest solicitation of the pope, Innocent X.

In 1602 he visited the court of France for the purpose of obtaining permission from the king, Henry IV., to pursue his missionary labours in the territory of Gex, which had been given up to France by a treaty of peace concluded between Henry of Navarre, son of Louis of Savoy, and Charles of France, which he preached in the chapel of the Louvre, is said to have created considerable sensation, and to have become the means of recalling several of the most influential of the Calvinistic nobility to a belief in their antestes faith. The king, desirous of retaining him in France, made him the offer of the first bishopric which might become vacant and the immediate enjoyment of a considerable pension. These offers however he declined, declaring that his being in France was to be permitted only on condition to live and die among those whose Providence had intrusted to his care.

On his return to his native country, after a residence of nine months in Paris, he was, by the death of De Granier, a prelate who appears to have been worthy of so illustrious a colleague, appointed to the bishopric of Geneva. He prepared himself by a close retirement of twenty days at the castle of Annecy, and a plane of dedication to this important office. In this retirement he framed for himself a rule of life by which he was in future to be guided; the details of it are given with elaborate minuteness in his biographer. (Venturi, Dei, Hist. Univ., iv. p. 313.) We shall only extract the passage which shows that he considered the faithful fulfilment of duty of greater importance in the sight of God than the exercise of bodily mortifications or the display of an ascetic

* * *

**La voix politique de Sis** says Bayle, "n'a point tellement tarie l'an 1699. Les organes de la France, qui en font un dessein, ont été sans compter. L'œuvre de la Réforme a été, comme celle de toutes les œuvres de l'homme que l'on fait forte qu'elle doit, et qu'avant d'explorer avait fait profession de la dévotion. (Bayle, Dict. Hist., art. "Sis"). See also Jacob Epin, Hist. de Genève, liv. v. p. 313. (Urencht, 1668.)
The claims of St. Francis de Sales as a devoted servant of the church have never been disputed, though they have been differently esteemed and represented. Humility and zeal were the essential elements in the saint's character. He refused to be promoted to the position of superior, and he was mindful of the wishes of others. Between him and Fenelon, a closer comparison might perhaps be made than with any other saint to be found in the Church. As a diplomatist, they possessed in common noble birth and a high station, with the tone and manner which these advantages are calculated to produce; the same talent in captivating the attention and winning the sympathy of the minds with which they came into contact. In the discharge of their pastoral duties they were alike successful, and by the use of the same means, a careful adaptation of advice to the temper and disposition of the advised. While, however, it must be admitted that Fenelon was a far more perfect diplomatist, and a theologian, he was probably inferior to his genuine disinterestedness and the practice of self-denial: he loved rather to labour among the rich and great than, like De Sales, to abandon the court in order to mingle with the crowd of the poor and suffering. Fenelon, it is true, performed with zeal those essential duties of a pastor when he was banished to his diocese; De Sales was continually separating himself from the court in order to perform in a manner which is perhaps more perfect to posterity. [FENELON, P. C.]

The most known of his writings, which are not very numerous, have been noticed in this article; the best edition of them is that of Paris, 1841, 2 vols. folio.

The impression which Bishop Butcher made in the church is not less evident in his writings, and the same is true of Bishop Butler, Charles Augustin De Sales, Henri De Maupas, Bishop of Evreux, Le Père Goulau, M. De Bussy Rabutin, and the Jansenist Binet. See also Alban Butler's Lives of the Saints; Moretti, Dict. Histoire des Actes et des Martyrs; P. M. Desaulles. [SA.MARA. SIMRISH, P. C.]

SAMEN or SEMIEN MOUNTAINS. [ADAMS, P. S.]

SAMENESS or IDENTITY. This term is generally applied to what is called personal identity, or the sameness of a living and intellectual being, as man. There are some remarks on this subject by Bishop Butler in his ' Dissertation of Personal Identity.'

The sameness of objects which are external to a man consists in the perception of a variety of circumstances as to these external objects and at different times, from which arises an opinion of sameness in a certain sense. A man sees a tree growing in a certain place, and he may have remembered it for many years. But in the mean time the tree may have increased a hundred-fold in bulk, and therefore its substance is not the same as that of the tree which he first saw there; and besides this, there may not be a single particle of matter the same in the tree at two remote times of his observation. The tree then is by the supposition not the same in a strict sense; but in a loose sense it is different. A man may no more believe that all the change that the tree has undergone belongs to some other tree, than he can believe that the growth of his own body belongs to another being than himself.

When sameness is applied to a living and intellectual being, it includes both the matter of the body and something else. A man can have no doubt that his body is not entirely the same in youth, in middle age, and in old age. He can view his body as he does any thing external, and he has a belief that it undergoes changes, and is therefore not the same in the strict sense. But yet he considers himself the same person; person here including something besides the body, whether it be something a property of an organized body or something else. 'The ground of the doubt,' says Locke, as quoted by Butler, 'whether the same person be the same substance, is said to depend on the consciousness of four or our own existence, in youth and in old age, or in any two successive moments, is not the same individual action, i. e. not the same consciousness, but different successive consciousnesses.' Butler's answer to this vague talk is sufficiently good. More may be said. How is consciousness of our personal identity, or if this form of words be objected to as a way of begging the question, how is the thing called 'consciousness of our existence' at any two successive moments of time? It is supposed that the consciousness is one and the same always; and if it is allowed that there is in man a belief that he is at different times the same being, in some sense which he cannot otherwise explain than that he feels that he is, it follows that this consciousness of personal identity is one indivisible thing, that it is as continuous as the personal identity itself which it presupposes. Nor is it any objection that such a personal identity may be materially impaired by disease, and he may lose the exercise of his reason and recover it; or an accident may befall him, which for a time robs his body and mental powers inactive, though he may finally recover both. On his recovery he does not doubt that as his personal identity is that of a person that he was before his illness or accident, and therefore his consciousness is one. The division of consciousness by successive times, corresponding to certain external signs, and the supposition that successive succession of consciousness in personal identity, is to confound things that are unlike, and to apply a measure to both that does not fit one of the things. Every person, says Butler, is conscious that he is now the same person as he was at the time his consciousness reaches.' This cannot be disputed. It is a bare fact that this consciousness does exist in us. We have not this consciousness from the time of our birth up to manhood and old age: it does not go further back in its particular manifestations than our remembrance does; yet we doubt not that we, the man, were once that particular child of our parents rather than any other child of these parents or of any other parents. But this belief is derived from evidence our consciousness in its particular manifestations does not extend farther back than our remembrance. Yet remembrance does not make personal identity, as Butler remarks: 'Consciousness of personal identity presupposes, and therefore is mere consciousness of personal identity, any more than knowledge, in any other case, can constitute truth, which it presupposes.'

The remembrance of particular things is a very different thing from that consciousness of personal identity. When this consciousness begins, when it ends, how its activity is suspended, we know not: but we know that it is a law of our nature that, in the ordinary state of a man's bodily and intellectual faculties, he has remembrance whatever it may be and however it may arise, whenever he reviews certain acts of his own or events in his life, that he be the perceiver, and no other person, is the agent or is the person affected by these events. The remembrance then merely makes the consciousness of personal identity active; and this consciousness of personal identity is not constituted of the remembrance of different acts or events, but is as permanent and uninterrupted as the animal life itself, which nobody supposes to consist of successive lives, but to be one life.

And it should be observed that the question of personal identity only arises upon the suggestion of the memory. Every man all through his life feels that he is in some sense or in some way, which he expresses by the term 'I.' And he is never without this present consciousness of existence. There is therefore an uninterrupted consciousness, which, as already observed, is one, and not divisible by a measure of time. The remembrance is on certain occasions an abstraction or a mere consciousness or act of memory. Even if any event in his own life, is a present act, and the consciousness of such present act of memory accompanies the act of memory as it does any other present act; and as the act of memory is retrospective, so is the consciousness of a memory retrospective, but only incidentally, according to the nature of the act. The memory merely directs the conscious agent to an act of the kind called passed, and to a passed act of such a kind that the consciousness of sameness in the agent is inseparable from the notion of the act that is remembered.

SAMULUS, a genus of plants belonging to the natural order Primulaceae. It has a 5-parted calyx, its tube adhering to the lower half of the germen. The corolla is salver-shaped with a short tube and a 5-parted limb with interposed converging scales. The stamens, 5 in number, are inserted near to the base of the limb of the corolla. The capsule is half covered by the persistent calyx, many-seeded, and opening with reflexed teeth.

S. edwardi, brookweed, has obonate or roundish blunt leaves, the upper leaves blunt with a point, the middle leaves linear, flowered ultimately elongated, the capsules subglobose. It is found in damp, watery places in Great Britain. [Linley, Vegetable Kingdom; Barnett, 'Outlines of Botany for School and College Teaching.]

SAND-EL. [AMMODYCES, P. C. S.]

SANDARAC. [THUJA, P. C.]

SAPIUM, a genus of plants belonging to the natural order Euphorbiaceae. The flowers are in compound umbels, and the capsules are 3-coccous. [B.]

S. anacampyrum is a tree 30 feet high, with oblong lanceo-
late, acute, serrate leaves, with an internode of larger and rounder teeth, coriaceous, shining, and about 6 inches long. The spikes are terminal, lax, thick, green, and about 6 inches long; the male above, the female below. The calyx of both is dark purple. It is native of the woods of Caratha.

S. indicum has alternate stalked leaves somewhat pendulous, broad, lanceolate, serrate, smooth, and of a deep shining green, from 2 to 4 inches long, and broad in proportion; the stipules small and deciduous. The calyx is 3 parted, the divisions somewhat cordate and expanding. The filaments longer than the calyx, the anthers ovate.

The flowers are at the base of the leaflets and often solitary. The capsule or nut is oval globular, of the size of a nutmeg; 3-celled, 6-valved, thick, and exceedingly hard.

The seed is solitary, affixed by the apex, ovate, and smooth. The juice of this species, like the former, is highly poisonous.

(Lindley, Flora Medica; Burnett, Outlines of Bot.)

SAPONA’RIA (from the Latin 'sapo', 'soap', so called because the bruised leaves are said to produce a lather like soap when agitated in water), a genus of plants belonging to the natural order Caryophyllaceae. It has a 5 toothed calyx naked at the base, 5 clawed petals, 10 stamens, and 2 styles. The capsules are 1-celled, opening at the top with 4 valves. The flowers are red or crimson.

S. officinalia, soap-wort, has fasciculate corymbose flowers, a cylindrical slightly downy calyx, retuse crowned petals, elliptic lanceolate-ribbed leaves, and an erect stem. It is native of Europe, and is found in the south of France, and in Britain, in meadows by rivers and under hedges. The flowers are either single or double, of a rose or pink colour, seldom white.

The double variety of this plant is esteemed as an ornament to the gardens of Venetiae. It was introduced into Britain in the reign of Henry III. In the kitchen, it is used in pots, from the spreading nature of the roots, which extend under-ground like those of couch.

S. vaccaria has panicked flowers, pyramidal, smooth, fine-angled at the root; ovate-obovate leaves; ovate, lanceolate, sessile leaves. It is native among corn in many parts of Europe, particularly Germany, Switzerland, and the Levant.

It derives its specific name from the idea that it increases the lacteal secretion in cows.

All the species of this genus are very ornamental. S. ocy- moides is one of the most elegant plants we have in our gardens, and is well adapted for rock-work. It has red or pink flowers and is a trailing plant. A mixture of sand, loam, and peat is best adapted for all the species, and they are easily propagated by dividing at the root, or by seeds; the young cuttings taking root freely under a hand-glass.

(Don, Gardeners' Dict.; Babington, Man. Brit. Bot.; Burnett, Outlines of Botany.)

SARCOSTEMMA (from σαρκός, flesh, and στέμμα, a crown, in reference to the leaflets of the inner corolla being flesh-colored), a genus of plants belonging to the natural order Capparidaceae. It has a rotate corolla, a corona of double stamens; the outer one cup-shaped or annularcrenated, the inner one 5-leaved, higher than the outer one, with fleshy sepals, which are nearly in his shape, round, flat, and smooth, and the seeds conose.

The species of the genus are natives of New Holland and the East Indies as well as of South America.

S. glaucum, glaucous-leaved Sarcostemma, is a lacerate smooth twining herbaceous plant. The leaves are lanceolate, short-stalked, slightly revolute, membranous, being with the midrib prominent on the under side, which is glaucous.

The umbels are many-flowered between the pedicels, on very long peduncles. The segments of the calyx lanceolate, dilated, and acuminate. The corolla white with a large fleshy annular wavy corona; the segments of the corolla fringed and spreading.

S. Brownii is a twining glabrous plant, with lanceolate acuminate glabrous leaves, and interpetiolate umbels; the pedicels, calyces, and corolla downy; the segments of the corolla ovate, bluish, concave, and glabrous inside; the outer corona an entire narrow ring; the leaflets of the inner corona ovate, bluish, and glabrous a little higher than the gynostegium. The lower leaves are large and ovate oblong; the upper ones becoming gradually narrower with revolute edges; painted with white on the nerves, and greenish blue on the veins.

The calyx is small; the pollen masses oblong, a little constricted, while hanging by short pedicles rising from blackish glands. These flowers thrive by in meadows, pastures, fields of peast, and vegetable mould; cuttings of them root readily in sand, if placed in heat without any hand-glass over them. They should have little or no water when in a dormant state, particularly the tuberous-rooted kind.

(Don, Gardner's Dictionary; Lindley, Flora Medica.)

SAROTHAMNUS, a genus of plants belonging to the natural order Leguminosae. It has a 5-toothed calyx, the upper tip with 2, the lower with 3 teeth. The style is long, curved, thickened upwards, and channelled within. The stigma terminal, capitate, and small. The pod is flat.

S. scoparius, broom. The only British species is a well-known plant, with a stem 2 or 3 feet high, angular, and glabrous. The leaves are ternate or simple, the leaflets obovate. The flowers are axillary, solitary, or in pairs, short-stalked, and large, and red. The pods are brown, hairy at the edges, and have numerous seeds. It is found on dry hills and heaths.

(Babington, Man. Brit. Bot.)

SATURNI'NUS, a name of several Roman jurists.

CLAUDIUS SATURNI'NUS is the name of a Roman to whom two Recipients of Antoninus Pius are addressed (Dig, 20, tit. 3, 1, 5 § 2; 50, tit. 7, § 4); and person of the same name was procurator under the Divi Fratres, the successors of Pius.

He is generally considered to be the author of a work in a single book, 'De Poenis Paganorum,' which in the Florentine Index is attributed to Venenius Saturninus. There is a single extant excerpt from this work in the Digest (48, tit. 19, § 16).

QUINTUS SATURNI'NUS is cited in the Digest (34, tit. 2, § 19, § 7) as the author of a work 'Ad Edictum,' in ten books at least. Whether he is the same as Claudius or not is uncertain.

VENENIUS SATURNI'NUS, a Roman jurist, who is simply called Venenius in the Florentine Index, though in the titles of the Excerpts in the Digest he is often called Venenius Saturninus. The 'De Poenis Paganorum Under Severus, 65' says that he lived under Alexander Severus; but there is some doubt about his period. His writings mentioned in the Florentine Index are, Ten Books of Actiones, Six of Interdicta, Four on the Code of Diocletian, and Nineteen of Stalinopithecus. The book De Poenis Paganorum has been already mentioned.

(Grotius, Flute Jurisconsultorum; Zimmern, Geschichte des Röm. Rechts, Heft 2, pp. 354, 379.)

SAURICHTHYS, a fossil genus of fishes from Axmouth. (Agassiz.)

SAUROCEPHALUS, a fossil genus of fishes from the chalk series of England and America. (Hays.)

SAURODON, a genus of fossil fishes from the chalk series of England and America. (Hays.)

SAUROFIS, a genus of fossil fishes from the oolite and lias terrains. (Agassiz.)

SAURUREA, a genus of composite plants belonging to the sub-order Cynaraceae. The flowers are all hermaphroditic and tubular. The anthers with ciliated setae at the base.

S. ophioides, an annual plant with a white or yellow ovate lanceolate, the upper ones sessile lanceolate, all distantly-toothed, the heads in a dense corymb, the involucres sub-cylindrical, with depressed hairy scales. This is the only British species: it is found in alpine situations.

(Babington, Man. Brit. Bot.)

SAUSMARZ, DE JAMES, ADMIRAL LORD, was born at St. Peter Port, in the island of Guernsey, on the 11th of March, 1757. His family name, De Saussame, bears evidence of Norman extraction, and mention of it is found in the earliest records of the Channel Islands. From early youth he manifested a strong inclination for the naval service, in which several members of his family had distinguished themselves. When thirteen years of age he entered as a midshipman on board the Molt, that the English fleet fought the battle of Winchelsea and Levant frigates, under the respective commands of Admirals Goodall and Thompson. On his return to England in 1775, he joined the Briolet, of 50 guns, under the command of Captain Abarbil, under which he distinguished himself in the attack on Charleston, in America: the courage he displayed on that occasion was rewarded by promotion to the rank of lieutenant. From that period to 1779 he was actively employed in the coasting service, and was employed in the service for the expedition under Lord Cornwallis. He was afterwards appointed second-lieutenant to the Fortune, Ad-
Sir Hyde Parker, and he was in the engagement which took place with the Dutch fleet under Admiral Zoutman, off the Dogger Bank, on the 5th of August, 1781. His behaviour in this action, in which he was wounded, caused him to be promoted to the rank of commander, and appointed to the command of a squadron.

In the month of December following, Captain Saumares was ordered to place himself under the command of Admiral Kempenfelt who, with twelve sail of the line, was commissioned to capture the Spanish man-of-war by the Spanish fleet under the command of the Comte de Guichen, and which was destined to assist the Comte de Grasse in the capture of Jamaica. To inform Sir Samuel Hood, the English Admiral in the West Indies, of the intention of the French fleet to make this expedition, and the importance, and Captain Saumares was selected for this service. While at Jamaica he was enabled, through an exchange, to obtain post rank and the command of the Russel, a ship of the line. In this ship he greatly distinguished himself at the memorable battle of the 12th April, 1782. [Hood, P. C.; Rodger, P. C.]

On the 29th July following, he returned to the Russell to England, and from thence to his native island, where he enjoyed in the society of his friends the peace which was soon after proclaimed. On the breaking out of the war of the French revolution (January 1793), Captain Saumares was appointed to the command of the Crescent, which had been sent to Cherbourg, after a warm action of nearly two hours and a half, the French frigate 'La Réunion,' of 36 guns, but of larger size and with a much more numerous crew. The British had 20 killed and 50 wounded, the French had only one man wounded, and that by the recoil of a gun. The success of this action procured for him the brevet of knighthood, and was so generally admired by the merchants of London with a valuable piece of plate. In the month of November following, Sir James Saumares was placed under the orders of Admiral Machrie, who gave him the command of a squadron consisting of the Crescent and Druid frigates, a brig, and a cutter, destined to assist the attempts made by the French Royalists to join the rising of the Vendéans. On the 6th of June, 1794, an opportunity was presented to him of displaying his skill and ingenuity, when, by the capture of Plymouth to Guernsey with the Crescent, Druid, and Eurydice frigates, he was attacked by a French squadron of more than double his force. A running fight ensued, the brunt of which was borne by the Crescent and the Druid, to cover the escape of the Eurydice, which, on account of its inferior sailing, ran considerable risk of being captured. This object being effected, he closed in with the enemy in the Crescent, and thus enabled the Druid also to escape into the roads of Guernsey. He effected the escape of the Crescent by his cool intrepidity and a perfect knowledge of the difficult coast in which he was engaged. As soon as the other ships were secured, the Crescent was ordered to return, and, after avoiding being taken, ordering the pilot, a native of Guernsey, to steer through a narrow passage between the rocks, which had never before been attempted by a ship of her size; he thus rescued the ship and crew, which was enabled to defy every effort of the enemy to take their vessel.

In March, 1795, Sir James was appointed to the Orion, 74, and placed under the orders of Lord Bridport, in which ship he opened the memorable battle which took place on the 23rd of June. In 1797 the Orion was attached to the squadron sent to reinforce the fleet of Sir John Jervis off Cape St. Vincent, and took a prominent part in the glorious engagement with the Spanish squadron. [Jervis, John, P. C.] He was after this battle employed till the end of April, 1798, in the blockade of Cadiz, and then selected by Lord St. Vincent to join the squadron under Sir Horatio Nelson destined to the Mediterranean; he was ordered to Toulon. At the important victory of the Nile, Sir James, as senior captain, was the second in command, and his ship was the third which entered into action; the courage which he displayed in the action has been fully confirmed by the concurrent testimony of several who were present at the action. The admiral was rewarded by receiving the Order of the Bath. On the meeting of parliament, a motion made by the Earl St. Vincent for the removal of Sir James Saumares was carried, in which Sir James received the thanks of the House for his gallant conduct in his late actions with the combined fleets of France and Spain. Lord Nelson remarked that 'a greater action was never fought.' The thanks and freedom of the City of London were also voted to him, with a valuable sword.

At the peace of Amiens, Sir James Saumares returned to England, and, in 1803, a pension of 1200l. a year was conferred upon him. On the re-establishment of the Royal Navy, he was appointed to the command of the Channel fleet, under Sir Alan Gardner, to bring home from Lisbon the ships captured at the battle of the Nile.

During the winter of 1799 and 1800 he was entrusted with the command of the squadron which was commissioned to watch the French fleet in Brest. The difficulties to be encountered in this arduous service, particularly during the winter season, were very great; and it is no small praise to the careful vigilance of this commander to say that, during the whole time he remained on that station, not a single vessel sailed from or entered the port of Brest.

At the commencement of the year 1801, he was promoted to the rank of rear-admiral, and on the 17th of June following was appointed to the command of a squadron to watch the movements of the Spanish fleet at Cadiz. On this occasion he was created a baronet. On his arrival at Cadiz, information was given him that the Spanish fleet was confined in the bay of Algeciras, and immediately determined upon attacking them. The position of the French was one of great strength, defended by the batteries in the bay and fourteen large gunboats. The action commenced on the morning of the 6th of July, in which he had the misfortune to lose the Hannibal, 74, which accidentally grounded, and, after a long and sanguinary engagement, Sir James found himself compelled to repair to Gibraltar. The failure of his first attempt on the French fleet did not discourage him. Expecting that the enemy's squadron at Cadiz would make use of the first opportunity which the weather might offer of effecting an sortie, he cast off from Algeciras, he hastened to put his vessels in a state of repair. This object was effected in a remarkably short space of time. On the 10th of July, a French and Spanish fleet, consisting, with the rest of the ships of the line that had been captured, was seen steering for Algeciras, with a squadron of not more than half the strength of the enemy; the admiral determined to attack them between the black and white, of preventing their return to Cadiz, and, on the 12th, sailed out to attack them. The enemy formed their line-of-battle off Cabrera. Shortly after the commencement of the engagement two of the enemy's ships were discovered to be on fire, and about midnight blew up with a tremendous explosion. An accident which occurred at daylight to the Venerable, Captain Brenton, the disabled state of the English ships, and the sudden falling of the wind, prevented the admiral from attaining his object, which was to prevent the French and Spaniards re-entering Cadiz; they did so, however, with the loss of three sail of the line, and upwards of 3000 men, blown up, killed in action, and taken prisoners. An important result of this victory was the preservation of a large fleet of British merchantmen, which it was the object of the French to seize. A most unforeshadowed imputation has been attempted to be cast on the military character of Sir James Saumares by a well-known modern French historian, who has asserted that, contrary to the rules of war, red-hot shot was used by him in that engagement, and that it was owing to these means that the burning of the Spanish ships occurred. The men had no other means of avoiding being taken, ordering the pilot, a native of Guernsey, to steer through a narrow passage between the rocks, which had never before been attempted by a ship of her size; he thus rescued the ship and crew, which was enabled to defy every effort of the enemy to take their vessel. The admiral was rewarded by receiving the Order of the Bath. On the meeting of parliament, a motion made by the Earl St. Vincent for the removal of Sir James Saumares was carried, in which Sir James received the thanks of the House for his gallant conduct in his late actions with the combined fleets of France and Spain. Lord Nelson remarked that 'a greater action was never fought.' The thanks and freedom of the City of London were also voted to him, with a valuable sword.

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The changes which took place in the aspect of affairs on the Continent having removed the presence of a British fleet in the Baltic no longer necessary, Sir James was recalled, and his recall accompanied by a letter from the Lords Commissioners of the Admiralty, in which they expressed ‘the usual sense of the zeal, judgment, and ability evinced by him during his late command.’

At the peace of 1814 he was raised to the rank of full admiral; on the visit of the allied sovereigns to England he received their personal thanks for the services which he had rendered to their cause, and, having accompanied them to Oxford, he obtained the honorary degree of Doctor of Civil Law. In 1819 he was appointed rear-admiral, and in 1821 vice-admiral of the Blue. In 1834 he was preferred to the command of port-admiral of Plymouth, which he held till 1827, and with it may be said to have closed his professional career. At the coronation of William IV. in 1831, he was raised to the peerage of the United Kingdom, with the title of Baron de Saumarez, of Saumarez, in the island of Guernsey—a reward which his long and important services had merited, and which it was expected he would have received at an earlier period. He was shortly afterwards made general of marines, and in 1834 an elder brother of the Trinity House. In the same year he was presented by the King of Sweden with a full-length portrait of himself, accompanied by the following letter, which showed that time had not effaced from the mind of the king the services rendered by Lord de Saumarez to Sweden. The remainder of his life was for the most part spent in the enjoyment of quiet and repose on his country estate in Guernsey. His religious zeal, charity, and affable demeanour had endeared him to his countrymen; and his death, which occurred on the 9th of October, 1836, was lamented as a public loss. He was succeeded in his title by his eldest son, James, the present peer, who is in holy orders.


SAVINGS' BANKS. The 5 and 6 Wm. IV. c. 57, passed in September, 1835, extended the provisions of the 2 Geo. c. 20, and of 5 & 6 Wm. IV. c. 14, to savings' banks in Scotland, and enabled existing banks to conform to the said acts by preparing and depositing their rules pursuant to these acts.

Military or Regimental Savings Banks were established by warrant dated October 11, 1843. The following is the amount of all sums deposited in them within the year ended March 31, 1844; of all sums withdrawn during the same period; and of the interest allowed upon such deposits; and also of the number of depositors on the 31st of March, 1844:

<table>
<thead>
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<th></th>
<th>£</th>
<th>s.</th>
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<tr>
<td>Amount of sums deposited</td>
<td>16,069</td>
<td>5</td>
<td>2</td>
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<tr>
<td>Amount of deposits withdrawn</td>
<td>316</td>
<td>11</td>
<td>54</td>
</tr>
<tr>
<td>Amount of interest allowed</td>
<td>96</td>
<td>10</td>
<td>11</td>
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<tr>
<td>Balance due by the public</td>
<td>14,849</td>
<td>1</td>
<td>114</td>
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<tr>
<td>Number of depositors</td>
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Summary of the 577 Savings Banks in England, Scotland, Wales, and Ireland, on the 20th Nov. 1844.

<table>
<thead>
<tr>
<th>ENGLAND</th>
<th>SCOTLAND</th>
<th>WALES</th>
<th>IRELAND</th>
<th>TOTAL</th>
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<td>23,489</td>
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<td>£16</td>
<td>£14</td>
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<td>2,483</td>
<td>2,300</td>
<td>11,333</td>
</tr>
<tr>
<td>Average Amount Invested by Each</td>
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<td>£14</td>
<td>£16</td>
<td>£14</td>
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<td>15,149</td>
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<tr>
<td>Average Amount Invested by Each</td>
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<td>£14</td>
<td>£16</td>
<td>£14</td>
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<tr>
<td>Number of Depositors</td>
<td>35,000</td>
<td>23,390</td>
<td>2,154</td>
<td>60,544</td>
</tr>
<tr>
<td>Average Amount Invested by Each</td>
<td>£15</td>
<td>£14</td>
<td>£16</td>
<td>£14</td>
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<td>Number of Depositors</td>
<td>61,001</td>
<td>23,489</td>
<td>31,657</td>
<td>85,527</td>
</tr>
<tr>
<td>Average Amount Invested by Each</td>
<td>£15</td>
<td>£14</td>
<td>£16</td>
<td>£14</td>
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</tbody>
</table>

On the 9th of August, 1844, the royal assent was given to an act (7 & 8 Vict. c. 83) entitled 'An Act to amend the Laws relating to Savings' Banks, and to the Purchase of Government Annuities through the Medium of Savings' Banks.'

The first clause of this act reduces, from and after the 20th of November, 1844, the interest of all moneys invested by the trustees of savings' banks in the national funds, to the rate of 3½ per cent.; and s. 2 declares that the maximum of interest to be allowed to depositors shall not exceed the rate of 3½ or 3½ per cent.

From the same date every depositor, on making his first deposit (s. 3), shall sign a declaration as provided by previous acts, a copy of which is to be annexed to the deposit-book; and once in every year at least this book (s. 6) is to be produced at the institution for the purpose of examination.

Any actuary, cashier, or other person holding a situation at a savings' bank (s. 4), receiving deposits and not paying over the dividend to the managers, is liable to be punished as a misdemeanor; but no trustee or manager to be liable (s. 6) for any deficiency unless they have declared in writing their willingness to be so responsible, and this responsibility may be limited by the circumstances in cases of money actually and personally received by them.

When deposits are made in trust for another (s. 7), the sum is to be invested in the names of the trustees and the person on whose behalf it was so invested is not to be made not to have the receipt of both, or of their trustees, executors, or agents appointed by power of attorney.

Annuities under the 8 and 4 Wm. IV. c. 14, are not to exceed (s. 10), if a will or letters of administration are not produced within a month, the money may be paid to the widow, or the person entitled to the effects of the deceased; if a depositor be illiterate and die intestate, the managers (s. 11), with the sanction of the barrister appointed to certify the rules, may pay the same to such persons as would be entitled to the same under the statute of distribution, if all the parties were legitimate; and where married women have made deposits it is lawful for them to receive, without the husband’s consent, the interest, to the extent not exceeding 3½ or 4½.

Where deposits exclusive of interest do not exceed 50l. (s. 10), if a will or letters of administration are not produced within a month, the money may be paid to the widow, or the person entitled to the effects of the deceased; if a depositor be illiterate and die intestate, the managers (s. 11), with the sanction of the barrister appointed to certify the rules, may pay the same to such persons as would be entitled to the same under the statute of distribution, if all the parties were legitimate; and where married women have made deposits it is lawful for them to receive, without the husband’s consent, the interest, to the extent not exceeding 3½ or 4½.

The time for issuing the half-yearly receipts for interest is extended (s. 13) to sixty days from and after the 20th of May and 20th of November, and the time for transmitting the annual statement is extended to nine weeks after the 20th of November in each year.

Any dispute between the depositors and the managers is to be settled (s. 14), by a barrister appointed under the previous acts, whose award is to be exempt from stamp-duty; the barrister is empowered for this purpose...
to inspect the books of the institution, and to examine witness on oath or affirmation: false evidence to be punished as a

Bond as given as security under previous acts (9 Geo. IV. c. 92, and 3 & 4 Wm. IV. c. 14) are to be deposited with the Commissioners for the Reduction of the National Debt (s. 10), to which the Governor, or any other officer or trustee, is bound to hold tender of not less than half the amount of the bond. Every officer of which the further receipt or custody of money (s. 17) is to give sufficient security, such security when given by bonds, is to be deposited with the principal and three managers when required to be cancelled. The direction for depositing the rules of a savings' bank with the clerk of the peace (s. 18) is repealed; bonds, written or otherwise, are not to be taken from the barrier for his certificate, who, on approval, is to return one copy to the institution, and transmit the other to the commissioners.

Payments to the relations of intestate depositors (s. 21) are to be made to the next of kin by the law of Scotland, in the case of deposits in that country.

The set is declared (s. 22) to extend to societies for purchasing annuities as well as to savings' banks, and (s. 23) to Great Britain and Ireland, Berwick-upon-Tweed, Guernsey, Jersey, and Isle of Man.

The name (s. 41) is C. S. A. (Cesarei, the Latin word for scab or itch, which disorder the common sort is said to cure), a genus of parasitic belonging to the natural order Dipaecidae. The inner calyx consists of 5 bristles, the outer one is membranous and plaited. The receptacle is exserted, with 8 clefts and 8 excavations. The corolla of 5-cleft with 4 stamens. The species are perennial or suffrutescent herbs with variable leaves. S. scutellaria, Devil's-bit, has an abrupt root appearing as if it were bitten off at the end, the heads of the flower and fruit nearly globose, the outer calyx hairy, 4-cleft, the lobes ovate acute, the inner calyx consisting of 5 bristles. The corolla is 4-cleft, the lower leaves toothed, the upper ones entire. The stem and both sides of the leaves hairy or glabrous. The flowers are dark violet or purple, varying to flesh-colour and white. It is native of Europe to the Caucasus, and is very plentiful in Britain. In cultivation the plant becomes much more branched than in a wild state. In days of superstitition it was said to be the devil's eating meat, hence its common name. According to Bergen, the root is astrigent, and an infusion of it is bitter and not unpleasant. A strong decoction of it was formerly an empirical secret for gonorrhoea. Linnaeus says the dried leaves are used to dye wool yellow or green. It is usually regarded as the type of the C. S. A. of Britain, but Fras thinks the plant of Discodiscos is the S. A. S. Brownioides.

S. colubrina has the outer calyx membranous, plaited, and notched, the inner one of 5 nerveless bristles; the corolla 4-cleft, the stamens 4. It has been discovered that, under the rays of light, the inner calyx, the involucres, the upper leaves pinnatifid, with linear segments. The flowers are purplish, the involucres narrow. It is native of Europe, Caucasus, and Siberia, and is very common on chalk and chalky grounds. The corolla is much rounder than the leaves, and the tips are acute. It is nourished with reddish tubes. The calyx consists of 5 reddish brown bristles. It is native of Barbary, Italy, and Sicily in fields, and is a cultivated plant.

Many of the species of this genus are well adapted for garden borders. The perennial and herbaceous kinds are easily increased by seed or by dividing at the root. The seeds of the annual kinds only require to be sown in the open ground; the shrubby species are increased by cuttings under a bank of peat, or by seed. (Don, Gardener's Dictionary; Lindley, Vegetable Kingdom; Botanical Magazine, of British Botany.)

Sca/vo/la, Qu. Cer/evi/duis, a Roman jurist, probably gave response in the time of Antoninus Pius (Dig. 34, tit. 1, s. 18); but he was certainly employed by Marcus Antoninus as a legal adviser (J. Capitularies, Marcu, 11; Dig. 34, tit. 1, s. 18). In his writings he speaks of the constitutions of Marcus and Verus, in terms which imply that they were alive. Septimius Severus, afterwards emperor, and Tafinian, Nellus, Capit. Ceres, who probably died in the year 203 (S. Severilis, Septimii, Capit. Ceres, 8). His response were often very brief, expressed in a single word (Dig. 17, tit. 1, s. 63); but the facts of which the opinion is given are clearly stated. His style has been blamed as obscure; but there is evidence of his great capacity, and he left a name behind him.

There are excerpts in the Digest of Justinian from his forty books of Digesta, six books of Response, twenty Libri Disputitationum publice tracurarum, probably a book of decided cases. The Florentine Index also mentions a single book 'De Quaestione Familiaris,' but there is no excerpt from it in the Digest. There are 307 excerpts from the writings of Scaevola in the Digest.

Many of the Responses of Scaevola appear twice, both in the Responsum and De Quaestione. As far as the author can see, the Digesta contained a fuller statement of the matters which are briefly indicated in the Responses, and were a kind of commentary to the Digesta. Puchta says that the passages in the Digesta do not show this; and that this relation is rather that of the Quaestiones to the Responses: 'the Quaestiones were devoted to the complete examination and justification of the opinions.'

Claudius Tryphonus and Paulus commented on Scaevola, and he is often cited by Marcianus, Tryphonus, Ulpius, Paulus, and Modestinus. Scaevola commented on Julian and Ulpius Marcellus.

A small leaflet, a remarkable cephalophagous fossil genus, irregularly convoluted at both ends, and occurring in the lower parts of the cretaceous system. (Parkinson.)

Sca/phi/ดus, a genus of fossil fishes from the oilite of ornithoid. (Asa.)

Scarlet Fever. [Scarlatina, P. C.]

Scarlett, Right Hon. Sir James, Lord Abinger, was a native of Jamaica, where his family was very wealthy and of long standing. He was the second son of Robert Scarlett, Esq., and was born in or about the year 1769. His mother's name was Elizabeth Anglin. The family estates went, it may be presumed, to the eldest son; a third son, who also remained at home and followed the profession of the law there, became Sir William Anglin Scarlett and Chief Justice of Jamaica, and died not long ago after having held that office for many years; James was at an early age sent to England. Having finished his elementary education, he was, about the year 1786, entered a Fellow Commoner at Trinity College, Cambridge; and he was also, a year or two after, admitted a student of the Inner Temple. He took his degree of A. B. A. in 1794, 1795, and 1796; and graduated M. A. in 1794. His success at the bar was very decided from the first, and every year added to his reputation and his emoluments. It was soon considered that the name of Scarlett should be changed so as to gain a large proportion of r evards. Even while he was still a junior counsel, he was very frequently entrusted with the sole conduct of important cases. At last, in 1816, he received a silk gown, and it was clear from that date he was recognised as the leader of his circuit (the Northern), and as occupying also a foremost place in Westminster Hall.

He had made an attempt to be returned to parliament for the borough of Lewes at the general election in October, 1812, but was defeated by Mr. George Shiffler, who was brought in, as second member, by a majority of 164 to 166; and he failed also in a second attempt on the same borough when a vacancy was occasioned in 1816 by the death of the other member, Mr. T. R. Kemp, being then defeated by Sir John Shelley. He was first introduced to the House of Commons in 1816, as one of the members for the city of Peterborough, under the patronage of Earl Fitzwilliam. He did not, however, make a figure in parliament corresponding to his eminence at the bar; nor was he a frequent speaker, although he both supported Sir Samuel Romilly and Sir James Mackintosh in their efforts to mitigate the severity of the criminal law, and also occasionally took part in debates on financial subjects.

He was returned again for Peterborough at the general election in 1826, but he resigned his seat in 1827 to stand for the University of Cambridge, and was returned by the University at the bottom of the poll. Upon this he was re-elected for Peterborough, but not till after a contest with Mr. Samuel Wells. Up to that time he had been considered as distinctly belonging to the Whig party, but he then broke all connection with that section of it; but his opinions gradually assumed more of a
Conservative complexion, and when the new Tory or mixed administration of Canning came into power in April, 1827, Mr. Scarlett, having been again returned for Peterborough at the general election of that year, accepted the office of attorney-general. He was at the same time knighted. Having been once more returned for Peterborough he retained his place till the administration of Lord Goderich; he succeeded by Sir Charles Wetherell when the Duke of Wellington became premier in January, 1828; but was reinstated in May, 1829, upon the dismissal of Sir Charles for his opposition to the Catholic Emancipation Act on the Bill; and, having been returned for Maldon at the general election in 1830, he remained attorney-general till the accession to office of the Whigs in November of that year, when he was succeeded by Mr. Brougham.

At the general election in May, 1831, Sir James Scarlett was returned to parliament for Cockeremouth. At the next, which took place after the passing of the Reform Bill, in December, 1832, he was returned, after a contest, for Norwich, along with Lord Stormont (now Earl of Mansfield). When this parliament was dissolved in December, 1834, on Sir Robert Peel being appointed premier, Sir James Scarlett was made Chief Baron, and a peer by the title of Baron Abinger, of Abinger, in the county of Surrey, and of the city of Norwich.

Lord Abinger died of a sudden attack of illness at Busty Street, on the circuit, on the 7th of April, 1844. He had been married twice; first in August, 1792, to the third daughter of Peter Campbell, Esq., of Kilmory, in Argyllshire, who died in March, 1829; secondly, in September, 1829, to the daughter of Lord and Lady Stranraer, of Jays, Surrey, and widow of the Rev. H. J. Ridley, of Ockley. By his first wife he had three sons and two daughters, by the eldest of the former of whom he is succeeded in his title and estate. His eldest daughter married Mr. (now Lord) Cornwall in 1821, and was created a peeress in 1836 by the title of Baronesse Stantheden.

Lord Abinger was a skilful and dexterous rather than an enterprising politician, and while on the bench he was more distinguished for the clearness with which he summed up a case to a jury than for the profundity or subtlety of his legal views. Yet he was considered also a sound and good lawyer. In the great art of gaining verdicts he was unrivalled; and no practicioner at the bar had ever before received so large a sum in fees in any year as he drew in the height of his practice. His conduct as attorney-general under the Tories in 1829, when he filed a number of criminal informations against the opposition newspapers, naturally exposed him to some severe animadversions from those who still continued attached to the more democratic political creed which he had originally been accustomed to profess.

Gent. Mag. for June, 1844.)

SCHEUFELEN or SCHEUFFELEIN, HANS LEONARD, commonly called Hans Scheuffelin, a very celebrated old German painter and wood engraver, was born in Nürnberg about 1490. His father Franz Scheuffelin was a merchant, and his mother, Ursula, daughter of Hans was placed with Albert Dürer, with whom he was a great favourite. He remained in Nürnberg until 1515, when he removed to Nördlingen, where he died in 1580 or 1560; probably the same year in which his widow was married again in 1540 to the painter Hans Schwarz.

There are several of Scheuffelin's paintings in Nördlingen, which the principal is the Taking down from the Cross in the church of St. George; it is a picture with two revolving wings, and was painted in 1521. There are several good paintings by Scheuffelin also in Nürnberg, Tübingen, Stuttgart, Oberdor, and other neighbouring places; and there are some in the galleries of Munich and Berlin.

There are also many woodcuts by Scheuffelin, and both woodcuts and pictures are sometimes attributed to Albert Dürer, to whom however Scheuffelin was inferior in all respects.

Bartsch, Peintre Graveur; Nagler, Neues Allgemeines Künstler Lexicon.

SCHEURTEL, LEVIN KARL FRIEDRICH, in the opinion of his own countrymen the great architectural artist of his age, and whose name has obtained European and permanent celebrity, was born March 13, 1781, at Neu-Ruppin, in Brandenburg, on the Elbe, the son of a painter sculptor, who had six years old he lost his father, and was placed by his mother in the 'Gymnasium' of his native town, where he remained till the age of fourteen, when he removed to Berlin. Soon afterwards an opportunity presented itself of becoming a pupil of the elder Gilly (David Gilly, born 1745, died 1808), a clever practical man in his profession, and author of several works on subjects relating to it. Hardy could he have been more fortunately placed; for about a twelvemonth afterwards, the younger Gilly (Friedrich) returned from his travels with an imagination warmed by his recent studies, and from him it was that Schinkel derived his best instruction, and together with an ardent relish for his art, more liberal and enlightened idea of its powers as a fine art were generally entertained in those days, when a system of mere routine both in theory and practice prevailed almost universally. Friedrich Gilly, the elder, was ambitious of elevating the architecture to the level of the other arts of design, and to bring it into immediate contact with them, whereas it was then, and perhaps now, is, too much regarded as one entirely apart from and independent of the arts of design, which himself would have achieved in his profession can only be conjectured, for he died within two years after his return, August, 1800, before he had completed his thirteenth year, leaving Schinkel to infer what he was unable to form or achieve. His studies had acquired such proficiency in practice it would not have been
difficult for him to have adhered to that course under others in the profession, and in the course of time establish himself in business; but he preferred pursuing his theoretical and artistic studies, containing in them to account by making designs of various ornamental articles for modellers, metal-workers, and other artisans of that class. Out of such earnings he laid by sufficient to enable him to study and to make copies of the great art termed the 'holy land of art.' In 1803 he set out for Italy, first visiting Dresden, Prague, and Vienna; and after extending his route to Naples and Sicily, returned to Berlin in the spring of 1805. But there the state of things was such that junction anything beyond the most exquisite to art, more especially architecture, to which the state of public affairs in 1806 and following years threatened a complete stoppage. He turned to landscape-painting, therefore, as an occupation, and set out to imitate the various scenes of scenery which he brought home from Italy, and embellishing his compositions with architectural accessories, or else making the architecture principal and the landscape the accessory portion of the subject. One work of note and which gained him distinction with the public was a large panorama of Palermo; and he also designed for the theatre many sets of scenes, a collection of which, including those for the Mozartfete, Die Braut von Messina, &c., were afterwards published in a series of colored engravings, whereby they are rescued from the usual fate of similar productions of the pencil. His various artistic labours during this period were, however, insufficient to make a fortune for his family, or to call forth and exercise those two faculties in which those who are otherwise able architects are generally deficient—taste and imagination. Even had they been serviceable to his path, they would have been insufficient to give the public a real conception of Schinkel's designs for the decoration of the new theatre, which was intended to confer a new aspect on Berlin, and conferred on it a high architectural character. One of the earliest commissions of importance which he received from the king (who was then at London with the allies), was to make designs for national cathedrals intended to commemorate the pacification of Europe; but though the architect's ideas excited great admiration, the scheme itself was dropped. Whatever the disappointment may have been at first, he had no time to dwell upon it, for from the period of 1815 he was incessantly and most actively engaged. Among his earliest buildings were the Hauptwache, Theatre, and Museum at Berlin, all of them treated in a pure Hellenic style—a style which had only been hinted at in such previous attempts at correct Grecian architecture as Langhans's once celebrated Brandenburg Gate. The façade of the Museum more especially displays, together with severe simplicity and correctness of detail, a freedom from superfluity and unthought-of for any previous modern example which is called Greek. The external elevation consists of merely a single line of eighteen columns in antis (Erechtheum Ionic) raised on a first and second floor. The first is a flight of steps, enclosed by pedestal walls (in continuation of the stylobate) and forming the ascent to the colonnade. Taken by itself, however, there would be nothing very remarkable in the general idea, whereas an extraordinary degree and kind also of variety and effect are given to the whole by the inner elevation or background behind the outer row of columns; which presents in the centre portion of it a second colonnade (four columns in antis), with a screen-wall rising about half its height, and above and beyond that the upper part of the open staircase, whereby the whole composition acquires singular movement and play both of perspective and light. How much the making the rest of this interior elevation, instead of being left a blank surface, or nearly so, is completely decorated from top to bottom, or rather was intended to be so, the upper division of it on each side of that inner colonnade being to be filled up by a single large fresco, the cartoons or designs for which were prepared by Schinkel himself, and have been extolled as masterly compositions. There is reason, however, to suppose that either they have not been completed, or the work is imperfect. It is being spoken of as the artist to whom the task is to be confided; and only when the frescos shall have been added, will Schinkel be able to see the effect contemplated by him for the building he has been engaged. Neither is the Museum the only one of his works which have not been completed—not yet, at least, according to his designs; for the two other buildings above mentioned have not received their full complement of sculpture, which, though it may be dispensed with for them as structures, is essential to them as works of architecture. It is fortunate, therefore, that in any case we have Schinkel's own ideas while they are still fresh in his mind. Whether he can be induced to put them into execution, or whether the various and extensive series of designs of all his principal buildings, some of which are illustrated and explained far less sparingly than is the custom in similar collections; for besides ornamental details, on which the designs are crowded, rare and tasteful, perspective views interior as well as exterior, and different ones of the same building are given; besides which, the engravings themselves are illustrated by the information contained in the letter-press, the publication of his designs contributed no doubt to spread Schinkel's fame much more rapidly than would otherwise have been the case; and it is that one forms a very complete gallery of his unusually numerous and never stilted visions of instruction. With such ready materials, a descriptive catalogue of his buildings might be easily drawn up, but we can merely mention a few of them: the Werder Kirche (Gothic), Bauschule, and Observatorium, at Berlin; the Theatre at Hamburg; Schloss Kronsnowitz, Charlottenhof, and the Nicolai Kirche at Potsdam, which last would have been a most imposing structure had the design been carried out, instead of being cut down altogether by the omission of the cupola. His 'Entwürfe' also contains his design for the Sing-Academie at Berlin—one of his happiest ideas, which was unfortunately set aside for that by Ottmer (Ottmer, P. C. S.); and six designs for a monument to the memory of Goethe and his free scope to his imagination, and indulged in luxuriant architectural pomp. Another publication, entitled 'Werke der Hohen Baukunst,' gives us a series of designs by him for the Albertinum at Dresden, for the royal palace at Aix-la-Chapelle, for the palace at Apocapoli, forming an irregular assemblage of courts, colonnades, and buildings, some of which, especially one magnificent saloon, would have been marked by originality of character as well as by the most effectual, for its design was much superior to that by Klenze, which is also published among those of the latter architect's; but, as has been said already elsewhere [Atlanca, P. C. S.], neither of them was adopted. Another remarkable project of Schinkel's, his last, but not his least poetical conception, was a design for a summer palace at Orlands, in the Crimea, for the Empress of Russia, surrounded by terraces and hanging gardens on a lofty eminence, commanding a prospect of the Black Sea. That was in 1839, the same year in which was conferred upon him the highest rank in his profession—that of Ober-Landes-Baudirektor; but it was to him a mere honour, for his career was closed; his health immediately after his election, and in the autumn of the following year, on his return from the baths, by whose waters he had hoped to benefit, he was attacked by an organic affection of the brain, which reduced him to a state of almost perpetual insensibility, to paralytic fits; and in that deplorable condition he remained upwards of a twelvemonth, till released from it by death on October 9th, 1841.

Schinkel has been called by some of his countrymen the Luther of Architecture; and he certainly gave a fresh impulse to the art: and if he himself did much, his example and influence have probably accomplished more; for by venturing to think for himself, he has led others to do the same. Yet with all his freedom and originality, he was, perhaps, rather too timid than too bold in his reforms, adhering in many respects too strictly to the original letter of Grecian examples, particularly in regard to the orders. As to Gothic, it would have been better had he abstained from it entirely, and given his undivided attention to the other style, first elevating and then maturing new ideas from it. With all his invention, too, he had expected none upon which such important features as doors and windows, for which he repeats the very same design again and again in different buildings.

Schinkel has been made the subject of biographical notices and of criticism more than any other modern architect. Of two separate publications relative to him, one entitled 'K. F. Schinkel, Eine Characteristik,' &c., 1842, is by Dr. Kugler; the other by O. F. Gruppe; and both of them have the portraits of him, but in the latter work the names of those who represent him in his usual dress, and with his hat on, and therefore conveys a better idea of his personal appearance.

SCHIZODUS, a fossil genus of conchifera, proposed to include species of Aequus of Sowerby.

SCHIZOPITTERIS, a genus of fossil ferns (Brenniaria) in the shales of the Yorkshire coast.

P. C. S. No. 151.

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CHIZIOSTOMA, a fossil genus of fossil gastropoda (Brom). Included in Euomphalus, or Pleurotomaria by other writers. Found in the paleozoic strata.

97. AUGUST WILHELM VON SCHLEGEL, was descended from a family in which learning and literary fame had been hereditary during several generations, in Germany as well as in Denmark, where a branch of the family settled early in the 18th century. His father, Johann Adolph Schlegel, D.D., who died in 1738, as Superintendent General of the Lutheran Church of Hanover. John Adolphus had four sons, Charles Augustus Maurice, superintendent-general at Hildesheim; John Christoph, who died in 1780; and John Christian, to whom Schlegel's name is popular to a degree which he would perhaps not have enjoyed at another time. 'Das Deutsche Museum,' a review which the brothers Schlegel founded in 1812, was the chief organ of the German Romantic movement. His brother, Christian, was a well-known literary critic and editor. Schlegel was trained in a liberal arts college and later studied law, but he was more interested in literature and philosophy.

Augustus William was born at Hanover on the 8th of September, 1767, and after having received a careful education was sent to Göttingen to study divinity, which he soon abandoned to devote his time to philosophy. Though young, he was no common classical scholar, for his Latin dissertation on the geography of Homer was highly thought of by Voss, then the professor of history. Among his earliest religious works was a Heine intrusted him with making an index to his edition of Virgil. For some years Schlegel lectured at the university of Jena on the 'Akademische Vorlesungen über Schöne Kunst' (especially his poem 'Ariadne,' and his essay on Dante), and to Schiller's 'Musen-Almanach' and 'Horen,' especially his translations from Dante with commentaries, secured him an honourable rank among the best writers of Germany. In 1797 he published the first volume of his translation of Shakespeare. In the same year he was appointed professor of Humaniora in the university of Jena, and continuing his literary activity he soon placed himself among the leaders of German literature. He remained at Jena till 1802, a friend of Schiller, and an admirer of Goethe, who then at Weimar, who, however, did not return the sentiment. Pushed by ambition, Schlegel left the little town of Jena, and repaired to Berlin, where he gave public lectures to a mixed but highly intelligent public on literature and the fine arts. He remained there till 1808, having meanwhile imbued that扑克 passion for little court distinctions, titles, and crosses, which in later years proved such a severe drawback on his real merits.

Among the specimens of his literary activity in the period from 1797 to 1805, may be mentioned, besides the continuations of Shakespeare's play 'The Alchemist,' a review, which he edited with his brother Frederic, and which did a great deal of good towards purifying the taste of the public; 'Gedichte' (Poems), Tübingen, 1800; 'Triennium,' which he edited with the 'Revue de Paris' and in which he first betrayed his growing tendency towards Romanism and mysticism; 'Vorlesungen über Literatur und Kunst des Zeitalters, (Lectures on the Literature and the Fine Arts of the Times), which appeared in 1803, 1804, and 1805, and was reviewed by Frederic Schlegel. In 1806 he made the acquaintance of Madame de Stael-Holstein. Surprised at finding so rare a combination of deep learning, uncommon poetical talents, and the manners of a courtier as Schlegel presented, she became his sincere friend, and he henceforth accompanied her during several years on her travels through various parts of Europe. The reciprocal influence of these two distinguished persons on each other was very great, and may be traced in their works: the result was, that he made her popular in Germany, and she brought him out in France, where his vanity afterwards met with so much gratification. At her invitation he published in France a correspondence between the Phébus de Racine and the Hippolytus of Euripides, and this work was the foundation of his subsequent fame among the French. In 1808 Schlegel delivered at Vienna a course of lectures on Shakespeare, and gave an evergreen monument to his genius. They were published under the title 'Vorlesungen über Dramatische Kunst und Literatur,' Heidelberg, 1809, 8vo. 2nd edition of 1813. The collection of his poems appeared in 1811, 2nd edition, 1820, among which are his masterpieces, Arion, Pygmalion, Saint Lucas, and others. At that time Schlegel and his brother Frederic were most successful in founding, in opposition to the models commonly called classical, the modern romantic school of poetry and fine arts which had its origin, in a great measure, in the depressed state of Germany and the deep wishes of the people for a moral, religious, and political reformation. Generations of enthusiastic patriots, and Augustus William having ventured to depreciate the French drama and to call Molière a mountebank, at a time when such liberties met with punishment or imprisonment, Schlegel was held in contempt and was regarded as a popular to a degree which he would perhaps not have enjoyed at another time. 'Das Deutsche Museum,' a review which the brothers Schlegel founded in 1812, was the chief organ of the German Romantic movement. His brother, Christian, was a well-known literary critic and editor.

The effect of 1815 produced a strange effect upon Augustus William: he accepted a secretariship from Bernadotte, the crown-prince of Sweden, and wrote political essays. No sooner however was Paris taken than he repaired to the country-seat whither Madame de Stael had retired, and kept her company till her death in 1818. She remembered him in her will. About that time he was placed among the titular nobility of Germany, the privilege of which enabled him to sign his name with a 'V' before his Christian and the family name of the person thus distinguished.

In 1819, Augustus William von Schlegel was appointed professor of history in the university of Bonn, which had just been founded by the king of Prussia: it is not known why he was made professor of history, for he had never written on history. He had now ceased to be a poet, but still ambitious of the honour of being a European author, he published several critical essays—of undoubted merit, however—in foreign languages. Such are, 'Le Couronnement de la Ste. Vierge, et les Miracles de la Trinité; Tableau de Jean de Fiesole; avec une notice sur la Vie du Peintre,' Paris, 1817, fol.; an essay on the famous Venetian horses, which he declared to be of Greek workmanship, in Italian, in the 'Biblioteca Italiana;' 'Réflexions sur l'Etude des Langues Asiatiques, adressées à Sir J. Macintosh, suivies d'une Lettre à Mr. H. H. Wilson,' Bonn, 1832, 8vo. To such minor works, however, he devoted only part of his time, for even previous to his appointment at Bonn, at the suggestion of his brother Frederic, he had made up his mind to study Sanscrit. He soon attracted a small number of students round him, and thus became one of the principal promoters of the study of the Sanscrit. The printing-office at Bonn owes its foundation to Schlegel, who, it is said, purchased the types at his own expense. Although he did not attain the exact knowledge of that difficult language which his junior brother with the aid of Bopp and others was yet no contemptible Sanscrit scholar, and surpassed Bopp and others in his general views: and it may be said that his principal merit consisted in encouraging students and aiding the study of the Indian languages, and other Indo-Persian languages. Schlegel in his turn was assisted by the superior learning of Professor Lassen. As early as 1820 he founded the 'Indische Bibliothek,' a review exclusively devoted to Indian languages and antiquities. Specimens of Schlegel's Sanscrit scholarship are, 'Ramâyana,' with a Latin translation and critical notes, Bonn, 1829; 'Bhagavat-Gita,' an episode of the celebrated Indian epic 'Maha-bharata.' It is especially interesting to the student of the study of the Indian languages, as well as to some of his critical essays on subjects connected with the fine arts and poetry that Schlegel owes the great esteem which he enjoyed in this country, and which is still maintained. In May, 1846, he published 'Essais littéraires et historiques,' Bonn, 1842, 8vo.
SCHMIEDELIA (in honour of Casimir Christopher Schmiedel, once a professor at Erlangen), a genus of plants belonging to the natural order Sapindaceae. It has a 4-lobed calyx. Petals obovate, 4-lobed, usually purplish. The petals from 6 to 10, inserted between the margin of the disk and the ovary. The ovary is ovoid, with 4 ovoid, ovulate, ovary cells each. The stigma 2-lobed. The style is an indubitable flower, which is receptive. The petals are similar in each cell, and covered with a pulpy aril. The embryo is much curved. The species are trees; the leaves abruptly pinnate, the leaflets nearly opposite. The flowers are small, discolored. L. trigyna has abruptly pinnate leaves from 6 to 16 inches long, the leaflets from 2 to 4, opposite, sessile, broad, lanceolate or oblanceolate, rather smooth on both sides the lower pair, the smallest from 3 to 8 inches long. The petals are a little downy, the stipules wanting. The racemes are axillary, or below the leaves round the base of the young shoots, solitary, in the male simple, in the hermaphrodite often compound, from 2 to 4 inches long. In the male flowers the calyx is cup-like, and 4-lobed. The corolla wanting, the filament from 6 to 10 erect, and many times longer than the calyx. The anthers oval and erect; the pistil a mere rudiment. The ovary is ovoid, ovulate, 3-lobed, with 3 ovoid ovules in each cell. The style is an indubitable flower, which is receptive. The petals are similar in each cell, and covered with a pulpy aril, which is of a pleasant acid taste, and most grateful during dry weather. It is a native of insular and continental India, where the astrangent bark, mixed with oil, is used as a remedy for the itch. (Lindley, Flora Medicina; Lindley, Vegetable Kingdom.)

SCHÖBERLIA, a genus of plants belonging to the natural order Chenopodiaceae. It has 5-stamen stamens from 6 to 10, inserted between the margin of the disc and the ovary. The ovary is ovoid, with 5 ovoid, ovulate, ovary cells each. The stigma is a 5-lobed disk. The style is an indubitable flower, which is receptive. The petals are similar in each cell, and covered with a pulpy aril. The embryo is much curved. The species are trees; the leaves abruptly pinnate, the leaflets nearly opposite. The flowers are small, discolored. L. trigyna has abruptly pinnate leaves from 6 to 16 inches long, the leaflets from 2 to 4, opposite, sessile, broad, lanceolate or oblanceolate, rather smooth on both sides the lower pair, the smallest from 3 to 8 inches long. The petals are a little downy, the stipules wanting. The racemes are axillary, or below the leaves round the base of the young shoots, solitary, in the male simple, in the hermaphrodite often compound, from 2 to 4 inches long. In the male flowers the calyx is cup-like, and 4-lobed. The corolla wanting, the filament from 6 to 10 erect, and many times longer than the calyx. The anthers oval and erect; the pistil a mere rudiment. The ovary is ovoid, ovulate, 3-lobed, with 3 ovoid ovules in each cell. The style is an indubitable flower, which is receptive. The petals are similar in each cell, and covered with a pulpy aril, which is of a pleasant acid taste, and most grateful during dry weather. It is a native of insular and continental India, where the astrangent bark, mixed with oil, is used as a remedy for the itch. (Lindley, Flora Medicina; Lindley, Vegetable Kingdom.)

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S. myriocns is found on turfy bogs in Great Britain. It has a round naked stem, from 5 to 10 spikelets, collected into a terminal roundish head, overtopped by the lower bract; the glumes subacute at the keel. The stem is clothed at the base with dark-brown smooth shining scales, some of which continue in setaceous ciliate leaves, which are shorter than the stem. The glumes are dark-brown or black. This is the

\textit{p.} \textit{myriocos} \textit{Henderson, Hist. Plant. 4, 18.}

\textit{Flora Botanica;} \textit{Flosc. Plantarum Flora. Classicae.}

SCHOOLS, INFANT. In the article Schools, P. C. p. 38, in speaking of the foundation of the Infant Schools at New Lanark, Mr. Wilson says: 'In 1819 Robert Owen went to London, having the idea of the Rev. William Turner, of Newcastle-on-Tyne, who, in the year 1818, when in conversation with Mr. Owen, remarked that in her attention to the education of girls, she had frequently wished some means could be adopted for getting poor children taken out of the hands of their parents at an earlier age, before they had formed bad habits at home, and among the idle children around them.' Much was said on both sides on the desirability of infant-schools, which Mr. Owen immediately established on his return to Lanark.

The author of the article Schools has informed the editor of the P. C. that his authority for this statement was a written communication from the Rev. William Turner before-mentioned. The statement however is proved to be erroneous by what is said by Mr. Owen in his report of the House of Commons in 1816. Henry Brougham, now Lord Brougham, was chairman of the committee, and the evidence is printed in the "Report from the Select Committee of the House of Commons on the Education of the Lower Orders in the Metropolis, June 1816."

Mr. Owen stated before the committee that he had paid particular attention to the education of children for twenty-five years, but that he had no opportunity of nuturing any of his pupils into execution till he went to New Lanark. He stated that he had been upwards of six years in the superintendence of the cotton-mills there, and that there were 444 children in his schools. He then was examined (1816) of from three to ten years of age, inclusive. As to the origin of the schools he says, 'I have been led in the establishment at Lanark, to receive children at the age of three years, principally for the purpose of preventing them from acquiring bad habits, which they would have done if they had been permitted to ramble in the streets among children who were ill instructed, and whose habits were bad; and also for the purpose of giving them good habits, and settling the knowledge they acquire more firmly in their minds. They are continued in the school upwards of seven years.'

Mr. Owen gave the following account of the management of the school:

'Harmon was received into a preparatory or training school at the age of three, in which they are perfectly superintended, to prevent them acquiring bad habits, to give them firm relations to form their character and habits, and a sincere desire to contribute all in their power to benefit each other. These effects are chiefly accomplished by example and practice, precept being found of little use, and not comprehended by them at this early age. The children are taught also whatever may be supposed useful that they can understand, and this instruction is combined with such amusement as is found to be requisite for their health, and to render them active, cheerful, and happy, fond of the school and of their instructors. The school in bad weather is held in apartments properly arranged for the purpose; but in fine weather the children are much out of doors, the air and sun may have the benefit of sufficient exercise in the open air. In this training school the children remain two or three years, according to their bodily strength and mental capacity. When they have attained so much strength and instruction as to enable them to unite without creating confusion with the youngest classes in the superior school, they are admitted into it; and in this school they are taught to read, write, account, and arithmetic, to sew; but the leading object in this more advanced stage of their instruction is to form their habits and dispositions. The children generally attend this superior day school till they are ten years old; and they are instructed to go at half-past four, and return for an hour or two every day during the whole of this latter period.'

In the year 1819 Henry Brougham, the Marquis of Lansdowne, Joseph Wilson, John Smith (who had seen the schools at New Lanark five years previously), Joseph Wilson, and other gentlemen, established, by subscription among themselves, a school in Brewer's Green (now Vincent Square), Tothill Fields, Westminster, on the plan of Mr. Owen's schools at New Lanark; and James Buchanan, an experienced teacher in New Lanark, was engaged, with Mr. Owen's approbation, to superintend the new school.

On the 24th of July, 1820, an infant school was opened in Quaker Street, Spitalfields, London. This school was established at the expense of Joseph and Sarah Owen, and was managed by Mr. Wilson. Samuel Wilderspin and his wife were engaged to manage the school, and their salaries were fixed and paid by Mr. Wilson. Mr. Wilderspin had been previously a clerk in a London bank, and engaged in mercantile business, and was in this situation for some years, and published a small work "On the Importance of educating the Infant Poor from the age of eighteen months to seven years, containing an account of the Spitalfields Infant School, and the new System of Instruction there adopted." By S. Wilderspin, master of the above school, 12mo., 2nd edition, with considerable additions, Lond., 1824.

The first edition was probably published in 1820, and it had no evidence. Mr. Wilderspin was afterwards employed in delivering lectures on infant education, in assisting in the establishment of new schools, and in otherwise promoting the cause of infant education in all parts of Great Britain as well as in London. Mr. Buchanan was master of the Westminster infant school about twenty years, and then went to America.

A pension of 100l. a year was granted (August 1848) to Mr. Wilson, and a pension of 200l. a year on the 3rd of August, 1848, in the House of Lords, made some remarks on Robert Owen's right to be considered the founder of infant schools, in which the Marquis of Lansdowne concurred, Mr. Wilson was also present. Robert Owen was called to answer August 6, 1846, (two letters, one to Lord Brougham and another to the Marquis of Lansdowne, in the former of which Mr. Wilderspin says—'With regard to Robert Owen and the system which Buchanan brought from New Lanark, your Lordship must be aware that the room at Brewer's Green was called an asylum, as was also the one afterwards established in Vincent Square, and that both contained a mere assemblage of children of all ages ranging from 18 months to 7 years, and at no time were disposed to be mere asylums as a refuge for destitute children, but not infant schools conducted on the system now called the infant school system. Buchanan did not become an infant teacher, nor did his school become an infant school until it had been re-organized by me, and he himself had instructed by me at the express desire of the committee. The system therefore which Buchanan taught was not Mr. Owen's, nor his own, but mine, of if therefore your Lordship means to state that Oberlin, Fellenberg, or Robert Owen, was the founder or inventor of the present infant school system, with its various arrangements, details, and implements, I must say that I never heard the Lordship's decision,' &c. Dated Bermondsey, August 6, 1846.

In the year 1824, Mr. Wilderspin, in the preface to the book mentioned, says, 'I do not know with whom the system of infant schools originated, but there is no doubt of its much importance to know this.' The first infant school that we heard of in this country was established at Westminster, in the year 1819. The master of that institution is J. Buchanan, who came from Mr. Owen's establishment at New Lanark. That Mr. Wilderspin made alterations, and also improvements in some respects, in the system, will be readily admitted; but from the evidence which has been quoted, it is obvious that the leading principles of infant education had been developed and the establishment of infant schools accomplished before Mr. Wilderspin was engaged in the management of the infant school system. The Church of England, in the "Journal of Education," vol. i., p. 359, &c. [Owen, P. C.] SCILENURUS, a genus of fishes fossill in the London clay. (Arms.)

SCILY. See Acanthopterygious ommous fishes, of which the genus Scilis is the type. They are closely allied to the perch, and resemble them in their general characters, but differ in having no teeth on the vomer and parasphenoid, and in the anal fin, which is armed with spines; the bones of the face and head are often cavernous, forming a protruding snout.

The "Scileniodes" are divided into those having two dorsal fins and such as have only one. In the first section we find
the genus Scionea, of which a single species, the maigre, Scionea aquila, occasionally wanders from the seas of Southern Europe into our own. Heaulme, Prisotonia, Diagramma, andamp; Apamphion are among the many genera belonging to the section of our subject.

SCINA; DOMENICO, born at Palermo in 1765, studied in his native town under Rosario Gregorio and other good masters, and became a proficient in classical erudition. He afterwards applied himself to the study of physical and mathematical sciences, and to the remainder of his life was chiefly devoted. In 1796 he was appointed Professor of Physics in the University of Palermo. He was repeatedly sent on journeys to the adjacent countries, and described the natural phenomena of the island, and he published the results of his observations. He gave an account of the eruption of Etna of 1811, in two letters: 1. Lettere scritte da Catania à Montignor Grano in Messina. He wrote on the currents of the straits of Messina: 'Memoria eti Fili Reifi, e i Vortici apparenti dello Stretto di Messina,' in which he gave a better explanation of them than either Spallanzani or Brocchi has done. In 1818 he published an interesting 'Topografia di Palermo et de' suoi Contorni; in which he describes the physical geography of the tract, its geological and mineral formation, its vegetable and animal productions, and its meteorological phenomena, and thus laid down the basis of the physical and meteorological map of the island. In the following year he was sent to explore the mountainous group called Monti Madonie, the ancient Nebrode, which rises in the centre of the island, especially with regard to the forests and agricultural productions. In 1820 he published 'Rapporto del Viaggio alla Madonie, istruzione per Ordine del Governo,' Palermo, 1819. In 1823 he went on a like mission to the district of Ogliastro, near Termini, where an earthquake had just occurred. The springs of the mineral waters from which the town of Termini takes its name. He wrote two reports on the subject, which were inserted in the Sicilian 'Giornale di Scienze, Lettere, ed Arti.' In 1817, a quantity of bone found in the same fossil remains found in the neighbourhood of Palermo, Scinco wrote a 'Rapporto sull'Ossa Fossilie di Mardolzo e degli altri Contorni di Palermo,' which excited much attention. When a voluntary collection of specimens of the sea-fossil was established, Scinco was sent to examine the new phenomenon, and he wrote a 'Breve Rappaglione del novello Vulcano.' Scinco was not neglected by the Sicilian government. Both King Ferdinando and his successor King Francis bestowed their favour upon him. In 1815 he was appointed historiographer of Sicily. In 1822 he was made chancellor of the university of Palermo, and a member of the commission of public instruction and education for the whole island. In 1823 he was made curator of the public library of Palermo, and also rector of the 'Educatario dello Nobili Donzelle,' or 'House of Education for young Ladies of Rank.' In 1839 King Francis presented him with a silver medal, and in the following year gave him the decoration of his own order, Scinco was also the author of the following works: 1. 'Introduzione alla Fisica Sperimentale,' 1806, a work which caused a great sensation, and in which the writer attempts to give a new view of the science of Physics. 2. 'Elogio di Francesco Maurolico,' a distinguished mathematician of Messina in the sixteenth century. 3. 'Memoria sulla Vita et Filosofia et Empedocle, Gentigento,' in 2 vols. 8vo., Palermo, 1815, a work more concise but not less accurate and interesting than that of F. W. Sturz, Leipzig, 1805, on the same subject. Scinco's book is divided into four parts; the first treats of the time in which Empedocles lived; the second is a biography of the Aggientine philosopher; the third treats of his philosophy; and the fourth is a collection of the fragments of his works translated and introduced into modern times. 4. 'Frommenti della Gastronomia d'Archeologia,' Palermo, 1823, with a biography of that ancient and little-known Sicilian poet. 5. 'Prospecto della Storia Letteraria di Sicilia.' The work contains an account of all the writers of any quantity of the pen in Sicily; the fruit mem-

SCIPIONE was a skilled archer, in reference to his proficiency into the art of archery. He is recorded to have been one of the most learned men that modern Sicily has produced.

(Tipaldo, Biografia degli Italiani Illustrati; Mortillaro, Sulla Vita et in Ens. ed Arte, Palermo, 1827. SCINK (Reptilia). [SCINCOIRAM, P. C.] SCIOPTIC BALL is a globe of wool about five inches diameter, with a cylindrical perforation 2 inches diameter passing centrally through it, and having at one extremity of the perforation a glass lens. The globe or ball is, by means of screws, fixed in a socket, which is made in a board about 8 or 10 inches square, in such a manner that while it cannot fall out, it is capable of being turned on its centre, to a small extent, in any direction.

The board being screwed to a window-shutter, or to the vertical face of a building in which an aperture has been made for the reception of the globe; the rays of light from external objects, after being reflected by the images of those objects on the opposite wall of the apartment, or on a white screen placed in a vertical position to receive the light; the apartment being darkened in order that the images may be distinct. The images on a vertical screen being inverted, two arms generally project from the board, within the room, and carry a plane mirror which turns on an axis so as to allow the rays of light, after passing through the lens, to fall on a screen placed in a horizontal position; by this means the spectators are enabled to see the images in erect positions. [CAMERA LUCIDA AND CAMERA ONSCIA, P. C.]

When the construction of the building is such as to allow the ball and lens to be fixed at an aperture in the roof, a plane mirror being placed above it at an angle of 45 degrees with the horizon, the rays of light can reflect the images of objects down on the lens, the images formed on a screen within the darkened apartment are more distinctly formed and more conveniently seen. An apparatus of this nature was formerly applied to the room in which the astronomical observatory at Greenwich, Edinburg, and Glasgow, for the amusement of visitors.

SICIRUS, a genus of plants belonging to the natural order Cyperaceae and the tribe Scirpeae; the stems uniform and equal glumes; the lower ones are perhaps the largest, and one or two of them empty. The bristles are either absent, or about six in number. The nut is plano convex or trigonous, and when wetted, or dipped in water, is of an oblong oval form.

S. maritimus has stalked or sessile spikes in a dense terminal cluster, several foliaceous bracts, bifold glumes, with an intermediate point; acute segments and a trigonous smooth nut. The stem is not only tending to the base, but erect, and the root is found in salt marshes in Great Britain, and is much relished by cattle. Withering says that the roots of this species are excellent, and have been ground down and used instead of flour in times of scarcity.

S. locustris, Bull., has a round stem from four to six feet high, naked, with one or two long sheaths at the base, the spikes in a terminal twice compound panicle; the glumes are emarginate, mucronate, glabrous, and fringed. The nut ob-

S. tuberosus is the tuberous or tubaceous, and when eaten is the principal food of the Chinese, and is cultivated by them for food in large tanks, which are regularly filled with water at intervals drawn off. The tubers are eaten both raw and cooked, and are consumed both as food and medicine. There are fourteen British species of Scirpus, none of which however are worth description on account of any quality of the panicle; the fruit membranous, one-seeded, indistinctly inclosed, included in the hardened calyx. The species are small herbs with opposite linear leaves which are rather coarse at the base. The flowers
are small, greenish white, and sessile in the axils of the forks of the branch.

S. annua, A. Fab., has subdecandrous flowers, segments of the calyx of the fruit, patent acute, with a very membranous margin as long as their tube. The styles are longer than the stamens, the stem green and repeatedly dichotomous. The flower green, often solitary. It is found
in the woods of Britain.

S. variegata, A. Fab., and Germanicum, A. Fab., inhale the vapour arising from a defection of this plant as a cure for the toothache.

S. perennis, with stellate flowers, the lobes of the calyx of the fruit closed, obtuse, with white and membranous edges. The styles are usually shorter than the stamens. The stem nearly simple, or irregularly branched, procumbent, and glandular. The flowers green and wide. It is found in sandy places in Europe, the Levant, and in England.

The Polish cockshel (Coccus Polonius) is frequently found on the roots and leaves of this plant in the summer months. The seeds of these plants only require to be sown in the open ground. None of the species are worth cultivating except in botanical collections.


SCROPHULARIA (from scrophulare, hard, and naked, grass), a genus of grasses belonging to the tribe Festucion. It has unequal acute membranous glumes. The outer pales with 5 faint but distinct and parallel nerves, membranous, cylindrical below, and keeled at the tip or with a very minute mucro. The styles are terminal.

S. maritima has a branched panicle, the lowest branches in pairs or simple, the branches alternately erect, the spikelets from 4 to 8 flowers, the rachis terete, the outer pales obtuse, apiculate, the midrib not reaching the apex, the root stoloniferous, fibrous, with rooting or ascending scions. It is found on sea-coasts and damp places in Great Britain.

S. distans is the Glyceria of Smith. It has a branched panicle, the branches elongated, ultimately spreading or deflected, the lowest in fours or fives, the spikelets linear, from 4 to 8 flowers, the rachis terete, the outer pales obtuse, with an apiculus formed by the extremity of the dorsal nerve; the root is fibrous; the flower large. It is found in salt marshes in Britain.

There are six British species of this genus.

SCLERODERMI, the second family of Plectognathous fishes (such as have incomplete and soldered jaws). The Scelodermi are distinguished by their conical or pyramidal snouts, ending in a small mouth, with distinct teeth in each jaw. The skin is rough, or covered with large hard scales.

The first division of Plectognathi is named Gymnonotidae. This group has no true mouth, but a substitute in a lamellated substance resembling ivory. Each fish covers the jaws. It includes the Tetradon, the Diastom, the Otagog, the isch, and other genera.

These are mostly tropical fishes, and are remarkable for their brilliant colours. One genus only occurs in the British seas, and that but very rarely; the Blaistes, or fish-like, is the one alluded to. The Ostracion is remarkable for having its body clothed in an inflexible armour of hard plates, the tail-fins, mouth, and gill-openings passing through holes in its coat of mail.

SCROPHULARIA, a genus of fish-bones belonging to the tribe Asplenaceae. The sori elongate, straight, and two together. The indusia of each pair opening towards each other. The leaves are convolute, is a generally handsome eel-like, ornamental form, and very different from every other British species. It is universally and abundantly distributed throughout the British isles. It is very commonly found on old walls and reposing in Europe and the North and in the United States. It is not however described as growing in Africa, Asia, or South America. The roots are black, stout, and very long and strong, the rhizomes fibrous, the leaves oblong, very young fronds make their appearance in April, growing in an erect position; by degrees they become horizontal, and at last pendulous. They arrive at maturity at the end of September, and continue in full vigour throughout the whole winter. The form of the frond is linear, elongated, and quite undivided, acute at the apex, and coriate at the base. This fern is the Pityrogramma of many and all botanists. It was once much in vogue as a medicine; it is mentioned as an astrigent to wounds and ulcers. Lighthouse says it is used by the people in Scotland as a vulnerary for burns and sores, and we learn from the Flores Franciae that it is used by the French as an astrigent in cases of diarrhoea and hemorrhage.

(Newman, British Firs; Babington, Manual of British Botany.)

SCORP. A. genus of Acanthophytogeous osseous fishes of the family Loricati. Their heads are large, compressed, or more or less armed with spines or tubercles; the body is slender, the head massive; the fins have all four rays; the branchiostegal membrane has seven rays; and the jaws and palatines are armed with velvety teeth. They reside mostly on rocky grounds, feeding on crustacea and small fish. One only inhabits our seas, and is very rare, the Beryl, or Norway haddock, a fish resembling the perch and attaining a length of two feet or more. In the Mediterranean are some beautifully-coloured species of this genus.

SCOTLAND, CHURCH OF. The constitution of this church has been considered under the heads of General Assembly, P.C., and Session, Kirk, P.C. An important portion of its history, throwing light on its present position, is narrated in the Irish Church. Of the Church of Scotland remains only chronologically to mention the chief events in the history of the church. The main struggles of the reformation in Scotland date at the middle of the sixteenth century. On the 31st of August, 1567, the Kirk of Scotland, at the head of the Romanish hierarchy, and on 20th December of the same year, the first general assembly was held in Edinburgh. In the ensuing year, the 'First Book of Discipline', still an important part of the ecclesiastical code of the established church, was drawn up. Various sects into which the Presbyterians of Scotland are now divided, was compiled. The fundamental principles of the reformed church were passed into an act of parliament in November, 1567 (2 Edw. VI.). The views of the Church of Scotland, the Faith and Doctrine believed and possessed by the Protestants of Scotland, exhibited to the Estates of the same parliament, and be their publick Votes authorized, as a Doctrine grounded on the infallible Word of God. This constitution however had more reference to doctrine than to church polity. It condemned some of the more prominent features of the system of the abjured hierarchy, but did not contain any announcement of the new system of church government. The early constitution of the church as approved by Knox and his friends, admitted of a difference of grades, certain clergymen being called 'Superintendents' of Provinces, which actually was a departure from the English bishops. The Presbyterian polity was at length established by the act of 1602 (c. 114), called 'Ratification of the Liberties of the trew Kirk of Scotland and certain Ceremonies of Discipline.' In the mean time those who had been the zealous clerical supporters of the reformation expected that the temporalities of the Roman Catholic church, at least, would be assigned to ecclesiastical purposes under the new system. They found however that the powerful laymen who assisted in the demolition of the old system had very different views. They spoke of this notion as a devot imagination,' and kept by far the larger portion of the spoil to themselves. After some hard struggles, in which the national feeling in favour of Presbyterianism was driven very nearly to an out- break, Episcopacy was re-established by the parliament of 1612. In 1637, the celebrated Liturgy, concocted by Laud and West, on principles nearer approaching to the Roman Catholic form than those of the English Liturgy, created the Church of England, or at least canonically established the Church of Scotland. On this occasion, great part of the assistance which the Covenanters received from the landed gentry was owing to their dread of a plan for restoring the church of England in the Scottish Kirk, the prevailing party in Scotland. Charles II., all the acts of the previous reign subsequent to the year 1625 were ' rescinded' or repealed, and consequently the Episcopal form of church government was restored. The system of church government in Scotland was not extended to the system on a people who abhorred it the more, the more stringently it was enforced on them by penal laws, is well known in history. These laws were relaxed, but not in a manner so as to give a just idea of the Church of Scotland, as James II, all to whom it was enforced by the established Episcopal
church. At the revolution the presbyterian form was re-established. The flowers of this plant are propagated, but prefer a moist situation. They are all readily propagated by seeds. The shrubby species require protection during the winter in a frame.

(Do. Gardener's Dictionary; Babington, Manual of British Botany; Burnett, Outlines of Botany.)

SCUTELLARIA (from the Latin 'Scutella', a 'little saucer', in reference to the form of the calyx; a genus of plants belonging to the natural order Labiatae. It has a capsule bilabiate calyx, the lips entire, the upper one with a concave scale on its back. The tube of the corolla, much exserted, 2-lipped, the viscid spur simple; the anthers of the two longer and inferior stamens 1-celled, of the shorter and superior one 2-celled. The leaves are opposite, simple, entire, and breve. The whole genus is remarkable for being provided with a cuneus, elongated support to its nut. This species was once considered efficacious in certain fevers. It is plentiful in Europe, Asia, and North America, in humid places, and in Britain.

S. minor, smaller Scutella, is a humble glabrous plant, with its leaves on short petioles, the lower ones broadly ovate, the middle ones ovate-lanceolate with the base cordate, the upper ones lanceolate, entire, acuminate. The corolla is white, variable and sometimes purplish; opposite, secured; the corolla almost glabrous, with the throat hardly dilated. It is native of Europe and Siberia, in damp places, and of Great Britain.

S. lateriflora has a slender stem, its leaves sessile, petiolate ovate lanceolate acuminate leaves rounded at the base; the upper floral leaves hardly exceeding the calyxes, the racemes axillary and terminal, the flowers opposite and secund. It is native of North America, on the margins of ponds, and was once extolled as a remedy for hydrophobia, but on no good grounds. Most of the species of Scutellaria are very pretty ornamental plants, and will grow in any common soil.

(Do. Gardener's Dictionary; Babington, Manual of British Botany; Lindley, Flora Medicinal.)

SCULLYODUS, a genus of fossil fishes. (Aguas.) From the chalk.

SCYPHIA, a fossil genus of Spongiae. Chiefly in the chalk. (Goldfuss.)

SEA-LIGHTS. Since the publication of the article Light-Houses, P. C., p. 478, some changes have been effected in the management of the coast-lights and beacons of the United Kingdom, and many important inventions for increasing the efficiency of sea-lights have been introduced. Our brief notice of these will be chiefly founded upon the First Report of the Select Committee of 1834 on the government of Light-Houses, in the session of 1834, and upon two papers on Recent Improvements in Light-Houses, published in the 'Penny Magazine' for 1842, pp. 286 and 294.

The Select Committee of 1834 had directed their attention chiefly to the alterations made in the lights and lighthouse establishments of the British Islands subsequently to the date of the Report of the Committee of 1834 (extracts from which are given under Light-Houses), report that by an act of 1836 (6 & 7 Will. 4, c. 79), all light-houses and sea-marks on the coasts of England were vested in the corporation of the Trinity House (Trinity House of Dedford, F. C., p. 245), which was empowered by the act to purchase the private light-houses of Harwich, Dunnegens, Winterton, Huxton, and Orford, which were held by individuals under leases from the crown; the Smalls and Longships, which were held on leases under the Trinity House itself; and the Skerries, Scarp, and Tynemouth lights, which were held by private parties in perpetuity under acts of parliament. The purchase of these ten lights was effected (the last in September, 1841), at an expense, by way of interest and payment for the interests of individuals, of 1,182,540l.; and the rights of the crown on the five first were surrendered on condition that the Possessions and Land Revenues of the Crown should be released from a debt of 300,000l. advanced out of the consolidated fund on their security. Thus, at a very large cost, the recommendation of the Select Committee of 1834 'to have all public lights placed under one board, and free from private claims' has, so far as the subject has been acted on, produced the desired effect, and, as the Committee of 1845 observe in their Report, parliament will thereby be enabled to legislate freely respecting them, in such manner as shall be considered best for the public interest.

Sea-lights are commonly divided into two principal classes,
of which the first, called in the Committee's Report Public General Lights, embraces such as are of use to all vessels passing the coasts; while the second, called Harbour or Local Lights, includes such as are intended specially for the use of vessels arriving at particular ports. The first class, or Public General Lights, are now, if in England, all under the management of the Trinity House; if in Scotland, under the Commissioners of Northern Lights; and if in Ireland, under the Ballast Board of Dublin. [BALLAST OFFICE CORPORATION, P. C., p. 330.] The second class, or Harbour or Local Lights, are 'managed, under powers given by the legislature, or emanating from other authorities, by corporations and local trustees, who collect the dues necessary for their support; but, under the act of 1836, the Trinity House has a general superintendence over those of England, their sanction being necessary to the establishment of new lights, and they giving directions as to the kind of light to be used, to avoid interference with the general coast lights. In Ireland, all the harbour lights, with the exception of one at Belfast, are managed by the Ballast Board, who receive the dues and pay the expenses of maintenance in the same way as for the public general lights.

From returns laid before the committee of 1845, it appears that the number of lights of all kinds has been greatly increased within a few years, as will be evident from the following details. The comparative number of lights of various kinds in England in 1834 and 1844 was as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>1834</th>
<th>1844</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public General</td>
<td>57</td>
<td>141</td>
</tr>
<tr>
<td>Local or Harbour</td>
<td>51</td>
<td>54</td>
</tr>
<tr>
<td>Total</td>
<td>108</td>
<td>195</td>
</tr>
</tbody>
</table>

In Scotland (where, from the returns, all appear to be fixed lights), the numbers were:

<table>
<thead>
<tr>
<th>Country</th>
<th>1834</th>
<th>1844</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public General</td>
<td>25</td>
<td>29</td>
</tr>
<tr>
<td>Local or Harbour</td>
<td>28</td>
<td>38</td>
</tr>
<tr>
<td>Total</td>
<td>53</td>
<td>67</td>
</tr>
</tbody>
</table>

In Ireland, at the same periods, the numbers were:

<table>
<thead>
<tr>
<th>Country</th>
<th>1834</th>
<th>1844</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public General</td>
<td>28</td>
<td>36</td>
</tr>
<tr>
<td>Local or Harbour</td>
<td>14</td>
<td>30</td>
</tr>
<tr>
<td>Total</td>
<td>42</td>
<td>66</td>
</tr>
</tbody>
</table>

In which returns are included 5 local lights which, in 1834, were not under the management of the Ballast Board, and, in the second division, 1 such (at Belfast) which was still, in 1844, out of their jurisdiction.

The aggregate statement, without distinguishing floating from fixed lights, stands thus for the two periods:

<table>
<thead>
<tr>
<th>Country</th>
<th>1834</th>
<th>1844</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>71</td>
<td>126</td>
</tr>
<tr>
<td>Scotland</td>
<td>35</td>
<td>55</td>
</tr>
<tr>
<td>Ireland</td>
<td>20</td>
<td>46</td>
</tr>
<tr>
<td>Total</td>
<td>126</td>
<td>227</td>
</tr>
</tbody>
</table>

showing an increase in little more than ten years (for the returns dated 1834 refer, at least in some cases, to 1833; while those given under 1844 appear to be actually for that year), of 85 lights, classified as follows:

<table>
<thead>
<tr>
<th>Country</th>
<th>1834</th>
<th>1844</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public General</td>
<td>20</td>
<td>29</td>
</tr>
<tr>
<td>Local or Harbour</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>24</td>
<td>45</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>1834</th>
<th>1844</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>22</td>
<td>29</td>
</tr>
<tr>
<td>Scotland</td>
<td>4</td>
<td>14</td>
</tr>
<tr>
<td>Ireland</td>
<td>4</td>
<td>16</td>
</tr>
<tr>
<td>Total</td>
<td>30</td>
<td>60</td>
</tr>
</tbody>
</table>

In addition to the above there were, in 1844, 7 local lights belonging to the Isle of Man, which, having been included in the returns for 1834, we have omitted in those for 1844. These raise the number of local lights for the United Kingdom 159, and the gross number 690.

Of the 94 fixed general lights in England and Scotland 76 were, in 1844, autoptic lights, with an aggregate number of 1008 burners, which gives an average of nearly 14 burners to each light, and 18 were electric, of power equal or aggregate of 258 burners, which gives an average power of 14 burners to each light. The aggregate illuminating power of the fixed general lights in England and Scotland, therefore, equal to 1562 burners, while that of the 25 English floating general lights (exclusive of that at Plymouth breakwater) was 288 burners, giving an average power of 1 ½ burners to each light. In Ireland the fixed lights had an aggregate power of 583 burners, which gives an average of rather more than 21 ½ per light, and the 29 harbour lights under the Ballast Board an aggregate of 216 burners, which gives an average of rather less than 7 ½ per light.

From the evidence laid before the committee of 1845 it would appear that the public general lights of the United Kingdom are in an efficient state, and, according to a witness who had ample opportunities of comparison, on the whole superior to those of the United States of America: while no complaints were made of their want of brilliancy or general efficiency, many were laid before the committee, both by petitioners and sworn witnesses, of the high charge for light dues, the mode of levying them, or the irregularity of their rates. How greatly the gross amount levied upon commerce in the shape of light dues has increased since the date of the Report of 1834 will be seen from the following comparative statement of dues levied in each division of the United Kingdom in 1834 and 1843. The return for England and Scotland appears to apply solely to general coast lights, no complete account being given of the dues from harbour lights; but that for Ireland embraces such, they being, as before stated, in the hands of the Ballast Board. Of the dues levied in England in 1832, only 83,041£, belonged to the Trinity House; private individuals, however, in 1843 the whole fell into the hands of the Trinity House.

<table>
<thead>
<tr>
<th>Country</th>
<th>1832</th>
<th>1843</th>
</tr>
</thead>
<tbody>
<tr>
<td>England</td>
<td>162,717</td>
<td>257,776</td>
</tr>
<tr>
<td>Scotland</td>
<td>35,526</td>
<td>48,840</td>
</tr>
<tr>
<td>Ireland</td>
<td>42,061</td>
<td>55,289</td>
</tr>
<tr>
<td>Total</td>
<td>240,304</td>
<td>365,905</td>
</tr>
</tbody>
</table>

The figures are from the statements laid before the committee of 1845, and it appears that these charges, which, in consequence of the general increase of shipping, are more oppressive to trade, are not only far higher than necessary for the mere maintenance of the lights, but are also levied with a more peculiar air of preposterousness, imposed upon particular branches of the shipping interest. Steam-packet companies especially complain of the amount of the dues as compared with the advantages derived. The Peninsular and Oriental, and the Steam-packet Company state that four of their vessels employed on the Peninsular line, of an average tonnage of 368 tons, and making fifty-two voyages in the year 1844, paid 122 7s. 4d. per voyage for light dues, or 845£, 1s. 4d. in the course of the year; and that two others, plying between Southampton and Alexandria, averaging 888 tons each, and making twelve voyages in the year, paid 28£, 14s. per voyage, or 356£, 8s. per annum. One case that appears of peculiar hardship is that of a partner in a trading between Granton, in the Firth of Forth, and Dundee, completing its voyages entirely by daylight, and therefore deriving no benefit whatever from the lights; but, which, nevertheless, paid during the following amount in light dues, which it was at work for forty-nine weeks, and three weeks refraining:

- Thirteen weeks of double voyages, at 16£, 13s. 9d. per week. Total 212 £, 18s.
- Thirty-six weeks of single voyages, at 10£, 10s. per week. Total 489£, 6s.

For total forty-nine weeks . 702£, 4s.

On the coasting trade also the light dues are found very burdensome, especially where the competition of railways is felt. One vessel employed in the coal-trade, of which particulars were laid before the committee, made in the years
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1843 and 1844 thirteen voyages, with an average load of 400 tons, carrying goods for the British market, and the cost of 6½. 10s. 7d. or more than 32 per cent. had to be paid for light dues; and Mr. Ogilvy, a London shipbroker of forty years' standing, stated in evidence that the traders to the principal ports in the British dominions should have part on 5s. 8d. per ton on the average of the year; that vessels from the Mediterranean and the South of Europe, making a less number of voyages, pay 3s. 6d. per ton; and ships to India and China, making one voyage in the year, 11s. 8d. per ton; and that the coasting trade, now in the present state of competition, would consequently benefit the most by the abolition of the light dues. The following table, compiled from the returns given in the Committee's Report, shows what proportion of the light dues of each division of the United Kingdom is derived from each class of ships.

<table>
<thead>
<tr>
<th>England</th>
<th>Scotland</th>
<th>Ireland</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coasting trade</td>
<td>126,673</td>
<td>27,745</td>
<td>19,091</td>
</tr>
<tr>
<td>British over-sea vessels</td>
<td>97,454</td>
<td>11,601</td>
<td>24,718</td>
</tr>
<tr>
<td>Foreign vessels</td>
<td>53,864</td>
<td>4,906</td>
<td>18,880</td>
</tr>
<tr>
<td><strong>Totals</strong></td>
<td><strong>257,775</strong></td>
<td><strong>43,840</strong></td>
<td><strong>55,298</strong></td>
</tr>
</tbody>
</table>

The light-dues are, it should be observed, charged upon the whole tonnage of a vessel, however small may be the crew, and are charged on the ground of the tonnage of the ship, whether one ton, or one box, or one passenger paying freight be on board from port to port, light-dues for the whole ship's tonnage is invariably charged; and consequently the ships often are loaded with a smaller quantity of cargo; a course of proceeding which, in the coast-trade of Ireland, operates very injuriously on the merchants, and on the consumers in the smaller ports to which the vessels go.

Of the recommendations of the Committee of 1845 for removing the evils complained of we need say very little, especially as nothing has, down to the close of the session of 1846, been done to give them legislative effect. Their principal features are the proposed transfer of the management of all public lights, buoys, and beacons, on the coasts of England, Ireland, and Scotland, to one central board, which it is suggested should be the Corporation of the Trinity House, with some modifications in its constitution; the defraying by government of the heavy debt incurred by the Trinity House in building up private lights; and the future maintenance of public lights, buoys, and beacons either out of the public revenues of the country, or by a small toll-rate on all the registered tonnage of the United Kingdom, and all colonial and foreign vessels entering its ports: such rate being made out of a large surplus revenue for pensions and charitable purposes. They suggest that it may deserve to be considered whether the ships of the Navy, and those in the Coasting Trade, should be put upon the same footing, as, as they now are, exempted from the payment of light-dues; and they conceive that a more economical mode of collection, by the agency of the officers of Customs, might be suggested by the general government.

One interesting detail of the investigations of the late parliamentary Committee is that relating to the cost of various modes of illumination. Their Report states that for many years past the French have used colza or rape-seed, which costs about 3s. 8d. per gallon, while the best sperm oil, which is usually burnt in English light-houses, costs from 6s. to 8s. per gallon. It is admitted that a greater quantity of colza than of sperm oil is necessary to produce the same effect, yet some of the witnesses examined expressed an opinion that one-half of the expense of the oil consumed might be saved by its use, and how seriously any such saving would affect the general cost of maintaining light-houses may be perceived from the statement that, out of 701l., the total expense of the Flamborough light in 1843, 302l. was expended on oil, and that in the Dungeness light-house the same item amounted to 225l. in a total expenditure of 639l. Mr. Alexander Gordon, however, in his evidence, objects to rape-seed oil because, in common with all other vegetable oils, it wastes by burning to over-flow, and occasions increased labour in trimming the lamps. He suggests that, in the case of small lights, it might be advisable to use rape-seed oil for the illumination of the lantern, and that the lights should be supported by the general government, there were, on the 1st of July, 1842, 243 fixed and 30 floating lights, having an aggregate power of 2671 burners.

In advertising these and the more important mechanical improvements recently introduced in the construction of light-houses, we may, first notice the construction of such buildings wholly of iron or other metal. Though first carried into effect by Mr. Alexander Gordon, this improvement would appear, from the first of the papers already referred to in the 'Fenny Magazine,' to have been previously suggested by the ingenious Captain (afterwards Sir) Samuel Brown, who is best known for his share in the introduction of suspension-bridges and piers, and who proposed to erect a light-house of either iron or bronze upon the Wolf Rock, near the Land's End. His plan was to construct a tower 20 feet high, 14 feet in diameter at the bottom, and 8 at the thinnest part, composed of several truncated conical pieces of cast metal, fitting one another like the joints of a telescope. Within the body of this metallic column were to be sleeping-bettas for the attendants, and store-rooms for provisions, fuel, water, and oil; and at the top was to be the keeper's house, surrounded by an open hanging-gallery, and surmounted by the lantern. Captain Brown's conception would pose would point the advantages of being much less costly than a stone light-house; of requiring much less time for its erection; of presenting a much narrower surface for the sea to act against; and of greater security and stability. In 1842 it was intended to have but eight joints from the ground to the lantern, while a stone structure would have many thousands, and that, the whole circumference of each stage or story being cast in one piece, it would be capable of resisting enormous pressure.

Captain Brown's simple and ingenious design was not carried out.

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*The discrepancy of 172 between these sums and those in a preceding table arise, in part, from the omission of fractions. The items given above are as in the Report.*

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is effect, but a cast-iron lighthouse on a somewhat different plan was erected in 1842, by Mr. Alexander Gordon, upon an unhealthy lagoon in Jamaica, where, owing to local difficulties, it was composed of a tower of marble, and about 1846 four or five such towers had been constructed for less than 20,000L., or in a less period than six years, with the almost inevitable loss of many lives. For this locality Mr. Gordon designed an iron tower, a model of which was exhibited at the great Exhibition of 1851, and it looked so promising that it was purchased by the Commissioners of Ireland. The erection was determined on by the commissioners in Jamaica on the 8th of March, 1841; some months after, the first was ready for about 120L.; and it was ready for lighting early in August, 1842, though not actually lighted until November. The cost of the tower and lantern, including the fitting up in London, taking to pieces, packing, and shipping it in destination, was 1,300L., and the putting up (exclusive of the excavation of the coral rock upon which it stands) cost about 600L. Additional. The diameter of the tower is 18 feet 6 inches at the base, and diminishes regularly to 11 feet at the top; and instead of being formed, as in Captain Brown's plan, of a few large castings, each embracing the whole circumference, it is formed of nine tiers of cast-iron plates, each 10 feet high, from 4 feet to 5 feet wide, and 4 inches thick, the circumference being composed of eleven such plates at the base of the tower, and nine at the top. These are cast with flanges all round their inner edges, and, when put together, these flanges form the joints, which are secured with flat nuts and washers, and caulked with iron cement. The cap or top of the column consists of ten radiating plates, which form the floor of the light-room, these being secured to the tower upon twenty pierced brackets, and an iron ring above by an iron cap. The lantern is also of iron, glazed with plate glass, and it is supplied with a revolving light, consisting of fifteen Argand lamps and reflectors, five in each side of an equilateral triangle; so arranged as to produce a continuous light, but with periodical flashes. The tower rests upon a coral rock, upon which is laid a grooved course of granite to receive the flange of the lower plates, from which lightning conductors extend into the sea. The base is covered with granite, to protect the iron from the action of such sea-water as might filter through the stratum of sand which covers the coral rock; and the protection is increased by coating the exterior of the iron with tar. The interior of the tower, to about one-fourth of its height, is filled up with masonry and concrete so as to form a solid core, which imparts great stability to the structure; and above this are the necessary rooms. Of the precise nature of the arrangements actually adopted for securing comfort in this singular habitation we are not informed, but it is stated in the 'Penny Magazine,' on the authority of a paper in the 'Civil Engineer's Journal,' published while the structure was yet in progress, "to preserve the internal temperature and the air currents and climate will permit, the iron shaft or tower is to be lined with a non-conducting material, such as slate or wood, leaving an interspace through which a constant vertical current of air is to be directed, so as to prevent the deposition of moisture and heat." In his evidence before the parliamentary committee of 1845 Mr. Gordon stated that a taller and better lighthouse of similar construction was in progress for Bermuda, which would be about 150 tons, and would contain in its base about 450 tons of masonry and concrete. Among the numerous advantages of this kind of lighthouse may be mentioned their superior safety in thunder-storms; the whole structure constituting a great unbroken conductor for the lightning; and the safety arising from the whole being virtually in a single piece, and therefore far better able than a tower of masonry to resist the shocks of earthquakes, to which, as well as to violent thunder, the Jamaican lighthouses have been repeatedly exposed. The iron-work is so constructed as to be readily put together from inside, without any external scaffolding; and these, in common with other iron lighthouses and beacons, have the convenient property of being easily removable, in case the shifting of sands or any other circumstance should render a change of position desirable; a contingency, which, as will be seen by reference to Sutherland, P.C., p. 206, has already occurred, and which is very likely to recur as the substitution of fixed for floating lights in the vicinity of shifting sands, and the application of harbour lights.

A somewhat similar construction of lighthouse was proposed in 1836 to a Select Committee of the House of Commons on Shipwrecks, by Mr. Bush, as suitable for erection on the coasts of New South Wales, where the extreme difficulties of the locality have hitherto deterred the Trinity House from establishing any other than a floating light or light-ship. Mr. Bush's plan, as then proposed, was to construct, on land, a wooden truncated cone 100 feet high, fixed in base at the top, and 90 feet at the base, and protected by a circular base cone which should be in contact with it at the base, but, diminishing less rapidly as it rose, should gradually recede from it towards the upper part and be cut off at an angle forming a cone, and so anchored by means of bolts into the soundings of the sea. Below this was to be filled with sand or other heavy materials after the structure was floated to the required position, so as to sink it in the sea until it found a firm bottom. The sand included in the cone was to be drawn out, leaving the double cone as a kind of cofferdam, and its place supplied with a solid mass of masonry or concrete, which might form a secure foundation for an iron lighthouse. The large window in the upper part would be covered with iron sheets without endangering the structure. Since 1836 Mr. Bush has, at his own expense, partially carried out his scheme in a modified form, using a cylindrical caisson of iron 64 feet high and 30 feet in diameter in lieu of the proposed timber cone; but it appears by the evidence laid before the Lighthouse Committee of 1845, that the Trinity House refused to sanction the lighting of his unfinished structure, and that some of its officers deemed Bush's plan to be impracticable. Mr. Bush proposed not merely a lighthouse, but an extensive asylum for shipwrecked sailors, and even the construction of a harbour of refuge at the Goodwin Sands. In connection with this plan Mr. Bush drew attention to the high cost of building in iron as compared with timber, and to the limits of our subject, the experimental safety-beacon erected in 1840 upon one part of the same dangerous sands by Captain Bullock. This beacon, which is intended to mark the space between a numbered chain and a beacon near or even as a beacon of direction, consists of a strong mast or spar about 40 feet high, surmounted by a flag-staff 10 feet high, and supporting, near its upper extremity, a gallery 9 feet in diameter and 15 feet 6 inches in height, principally of sail-cloth, capable of holding forty persons, to which access may be obtained from below by means of ropes and ladders or notches in the mast. The mast or shaft is secured to a massive platform or cap of oak, surmounted by a cap of iron, and is loaded with upwards of three tons of iron ballast; and it is further supported by oblique bars of iron and chains. The mainmast or shaft of the beacon stands about 60 feet above the dry sand at low water, and 17 feet 6 inches above high water at spring tides. In the gallery is placed a barrel of fresh water and a bag containing a blue flag, which is to be hoisted when assistance is required from the land, which is seven miles distant; and to render the beacon accessible to all who are likely to make use of it, directions to 'hoist the flag' are painted in eight different languages on the sides of the gallery.

Perhaps the most curious recent invention connected with our subject is that of Mr. Alexander Mitchell, of Belfast, for constructing lighthouses and beacons entirely supported by piles, which, instead of being driven into the ground like those usually employed, are supported by ordinary mooring screw or mooring posts, each provided with a screw attached to their lower extremities. These screws, which were first employed instead of mooring-anchors, are of cast-iron, and consist of a broad thin plate or share wound round, the upper end being cast in the form of a screw, and the diameter of the screw being from two to five feet, and the thread or share taking only one turn and a half round its axis, and having its outer edge sharp, so as to cut its way readily, and when the axis is turned round by suitable means, into sand or earth, while its broad surface offers great resistance to any attempt to pull it out of its place. The great success of this invention, as applied to moorings, led to the attempt to apply it to the erection of lighthouses upon sands, for which purpose it bade fair to become highly important, as such lighthouses may be erected where there is not sufficient depth of water to moor a light-ship, and fixed lights are always more secure and less expensive to maintain than floating lights.

The first screw-pile lighthouse was commenced on the Maple sands, at the mouth of the Thames, in 1838, by screwing into the sands eight wrought-iron shafts, arranged so as to form an octagon of about 40 feet diameter, with a slight inclination inward towards the upper extremities, and a ninth perfectly upright, in the centre. These shafts were about 28 feet long, 21 inches in diameter, and to their upper ends were secured a series of cast-iron pillars, strongly braced and bound together, supporting a massive timber framework upon which is built the lighthouse, comprising store-rooms and apartments for the keepers. This lighthouse was not completed until February, 1841, but in
November, 1839, a similar structure, supported upon seven instead of nine piles, was commenced at the mouth of the river Medway. It was designed to form the new port of Fleetwood, which was completed in June, 1840, at a cost of about 3500£. In both these structures the supporting framework is left open to a considerable extent, and large, smooth surfaces of water are exposed to the action of the waves, which are reflected back with such force that they serve to keep the shores clear. The works in question are not new establishments, but are intended to be made to accommodate the traffic of large ships, and the object is to prevent the formation of a beach. The works are constructed of timber, and are supported by steel arches. The whole is to be completed in two years, and the cost is estimated at 1200£. The structure is to be made of iron, and is to be constructed in such a manner as to be capable of being raised or lowered at will. The works are to be carried on by the company, and the cost is to be met by the Government.

**SEAMEN.**

_Employment, Wages, &c., of Merchant Seamen._—The 5 & 6 Wm. IV. c. 19 repealed all former acts which regulated the wages of seamen. The 5 & 6 Wm. IV. c. 19 has been repealed, (except so far as such act repeals the acts thereby repealed, and except so far as relates to the establishment, maintenance, and regulations of the office called 'The General Register Office of Merchant Seamen'), by the 7 & 8 Vict. c. 112, which contains the present law relating to merchant-seamen and for keeping a Register of them. This act contains sixty-four sections: s. 6, &c. regulate the agreement of hiring seamen; s. 6, &c. assign the punishment of seamen for refusing to join the ship, or absenting themselves from it; s. 9 fixes the forfeiture for desertion; s. 11 the periods within which wages must be paid; s. 13 the payment of wages; s. 14 the payment of wages not exceeding twenty pounds; s. 17 provides for seamen being sent home when the ship is sold in a foreign port; s. 18 regulates the supply of medicines, lime or lemon juice, and other provisions. The act also contains a schedule of the words and phrases used in the act, and a schedule of the words and phrases used in the act.

The second of the two papers above referred to in the _Penny Magazine_ contains a notice of an important suggestion made by Captain Basil Hall in a letter to the _Herald of Service_, in reference to revolving lights. A fixed light, if required to be seen in one direction only, may be readily mounted with a parabolic reflector, so as to show at a very great distance; but where the light is required to be seen in all directions a difficulty arises, because, even supposing twenty-four distinct lamps, each having its own reflector, to be arranged in a circle, they will, owing to the light being reflected by the parabolic surfaces, be seen in all parts of the horizon, leaving the intervening portions in darkness, while at the same time the light will, from being so divided and scattered, be less efficient than if it were concentrated undivided by the parabolas. The greatest advantages of revolving lights, for instance, as the case is put by Captain Hall, instead of twenty-four lamps arranged at equidistant intervals round the circle, six are directed by their reflectors, due north, due south, due east, and due west, and that part of the lighthouse upon which the four sets of lamps are mounted be caused to revolve upon a vertical axis, the four concentrated blazes of light, instead of illuminating only the four points to which they were originally directed, will light up, in succession, every part of the horizon, and that with a blaze of light six times more powerful than in the case first described. As, however, variety is essential to prevent one light becoming wearisome to another, it frequently happens that a fixed light must be adopted for the sake of distinction, notwithstanding its inferiority. Captain Hall suggests, therefore, that a revolving light should be made to rotate on its axis with such rapidity as to exhibit an unbroken line of light along its path, on the principle of a burning stick whirled round so as to produce the appearance of a circle of fire. By this means, light would, with the superior brilliancy of the revolving light, be continuous in every direction.

An important improvement has recently been introduced by Professor Kirwan, a method of producing a revolving light, upon which paper was read before the Institute of Civil Engineers on the 27th of June, 1843. The want of proper ventilation in ordinary lanterns occasions the production, by the combustion of the oil, of water and carbonic acid. The water condenses upon the glass windows and dims them, while the carbonic acid often renders the air in the lantern so irrespirable as to render it very difficult for the keepers to attend to the navigation of the vessel. Owing to the exposure of lighthouses generally, ordinary means of ventilation, by allowing the free admission and egress of air, are inapplicable; but Mr. Kirwan, having his attention directed to the subject by the late John Hogg, has proposed a contrivance which has answered well, and which does not endanger the lights by permitting gusts of wind to get into the bowl. The contrivance is very fully described in an abstract of the paper referred to, in _The Athenæum_ 1844, p. 697.

**SEA-NETTLE.** [Actinia, P. C.]

**SEAMEN.**
on shore, to the sea-service, to be employed as is provided in the case of apprentices to the sea-service under s. 32, for the period then remaining unexpired of their apprenticeship. Several persons present, including the Lieutenant of the eighty tons and upwards, except pleasure-yachts, shall have apprentices in proportion to their tonnage, as in this section provided; all which apprentices must at the time of being bound be under the age of twenty-five years, and have completed ten years of age, and be duly bound for four years at least. Section 50 provides, 'That nothing in this Act, or in any agreement contained, shall prevent any seaman or person believing himself to be deserting, or taking any vessel, what it may have been entered into the naval service of her majesty, nor shall any such entry be deemed a desertion from the ship or vessel, nor shall such seaman or other person thereby incur any penalty, to be either of wages, clothes, or effects, or other matter or thing.'

The commerce of Great Britain gives regular employment to a vast body of seamen, and the habits and occupation of a large number of people on the sea-coast give them a relish and a capacity for sea-service. With the great increase of the commercial navy of Great Britain which has taken place of late years, and the prospect of still greater increase of commerce by the restrictions on trade being removed, we may always reckon on a sufficient number of seamen in the commercial navy to make up the deficiency in the royal navy in case of a sudden war. The apprenticeship system also is well devised to keep up a regular supply of young seamen. It is probable that ten or twenty thousand men might be at once drawn from the commercial navy for the royal navy on any sudden alarm, although among them better men might be prevented from being imported. The amount of inconvenience that may be sustained by the merchant-service by the withdrawal of a great number of seamen at once, is the same, whether the seamen are impressed or go as volunteers; but to the inconvenience arising from the actual withdrawal of seamen by impressment must be added the loss and inconvenience to the merchant-service which may arise from seamen keeping out of the way in order to avoid being impressed.

SEDITION (from the Latin sedition). It is stated that in many of the old English common law writers treason is sometimes expressed by the term Sedition; and that when law proceedings were in Latin, sedition was the technical word used in indictments for treason, till it was superseded by the word pro ditio. Sedition does not appear to be very exactly defined. It is stated to comprehend contumacious, indecent, or malicious observations upon the king or his government, whether made in words only, or in writing, or by tokens (which last term must be understood), and of acts committed looking to or bringing him in the opinion of the subjects or to weaken his government. All those offences fall short of treason; but they are considered crimes at common law, and punishable by fine and imprisonment.

There are also statutes against particular acts of sedition, such as seditious libels. [Law, Criminal, P. C. S., p. 176, No. 40.] There are also various acts against societies established for treasonable purposes, and against sedition meetings and assemblies.

The Roman sense of Seditio (sed or se, and i6, a going apart, a separation) is properly a disunion among the citizens, a riot, or turbulent assemblage of people for the purpose of accomplishing some object by violence or causing fear. It was included among other forbidden acts in the Lex Julia de Majestate. (Dig. 48, tit. 4.) It is often used in connection with 'delinquent' and 'turbulent,' and the three terms seem to have the same signification. (Rein, Römisches Criminalrecht, p. 262.)

SELM II. The son of Sultan Mustapha III. was born Dec. 1764. Mustapha III. was succeeded by his only brother Abdul-hamid, and Selim was shut up in the seraglio among the women and eunuchs. Abdul-hamid died April 7, 1768, and Selim then became sultan. The principal events of his reign are the following: He married a Turk, Turks, P. C., p. 404. He was deposed May 29, 1807, and Mustapha IV., son of Abdul-hamid, was elected in his place. Selim was put on government, and was strangled by order of Mustapha, July 28, 1808. Mustapha was deposed, and immediately the sons of Selim was set up, and was succeeded by Mahmod II. (Mahmud II., P. C. S., Mustapha IV., P. C.)

SELVA, GIANNANTONIO, was born of respectable parents, at Venice, June 15, 1758, and had for his earliest instructor his uncle the Abbate Giannantonio Selva, a man of considerable literary and scientific attainments. His inclination leading him to make choice of art as a profession, he was placed in the studio of Novelli (a painter who died in 1804, aged 75); but after he had ground himself in drawing and the elements of painting, he passed to the study of architecture, and became a pupil of Canova, with whom he visited Naples, Pompей, Caserta and Pozzúm. While at Rome, he also obtained the notice and favour of his countryman the nobleman Giuseppe Zulian, who also was then the ambassador from the republic, and who was a liberal encourager of art. By him Selva was commissioned to emboss and fit up a salon in his palace expressly for an entertainment given to the Ambuscardi Ferdinando of Austria and his bride; before which he had been similarly employed by the Senator Reszonzio to decorate an apartment for him, which was to have been done by Canova, but that architect was then obliged to depart for Ferrara. [Trezanoni, P. C.] On quitting Rome Selva visited France and England, in both which countries he diligently collected information of every kind bearing upon architecture and building; and returned to Italy much improved. He had, moreover, been offered, he introduced various practical improvements, and among them greater attention to internal convenience and disposition of plan, setting also the example of a more sober and simple style of building. As soon as he was engaged in his first important work, the Theatre della Fenice, his design for which was selected from among those sent in by twenty-nine other architects [Theatre, Hebe, P. C.]. Another structure of the same class designed by him was the theatre at Trieste, but in the execution of the work very great liberties were taken. A third theatre planned by him was never executed, but when he was some years afterwards at Florence, he found that parts of his design had been adopted for the theatre then lately erected there. To the above may be added the façade of the Casa Vigo d'Arzeri, and a Casino at Padua; the Casa Vela at Verona; the façade of the church Spirito Santo at Udine; the façade of San Maurizio at Bergamo; the façade of the Casa di Carpani, after whose death it was completed with some modifications by Diedo. The same fate attended his last and most favourite work, the small church Del Gesù, which was finished not long after his death. (Archive of Venice, 1781.) For the work of Venice his designs (author of important works and descriptions in Cicogna's ' Fabbriche piú consigli di Venezia,') and Giuseppe Borso. Selva died rather unexpectedly, at the beginning of 1819, and therefore could not have carried out his last work. (Triglè says he died at Possagno, the first stone of which was not laid till July 11th in that year. Two years before, indeed, he made a journey to Rome expressly to visit his friend the illustrious sculptor, and he may probably have then given the latter some hints and ideas, but beyond that he certainly had no share in the structure. Selva was also a writer upon subjects of his art; he as well as Diedo contributed to Cicogna's work above mentioned; and also to Formigli's treatise on the orders, and Chambers' 'Civil Architecture.' There is a portrait and short notice of Selva in Gamba's 'Galleria de' Litterati.'

SEMI NOTUS, a fossil fish from the lapis. (Agassiz.)

SEMITIC LANGUAGES. [Araba, P. C., p. 218; Aaram, or Aaramic Language, P. C.; Hebrew Language, P. C.; Sabrze (in honour of John de Senebiel, of Geneva, a vegetable physiologist), a genus of plants belonging to the natural order Cruciferae. The flower is somewhat kidney-shaped, entire at the end, or notched above and below, and almost 5-lobed. It is immediately followed by the calyx and the calyx stands a sepal one seeded. S. cornicopus, common wart-cress, has an undivided uniform crest; with some sharp aliers, the pouched in dense clusters. The leaves pinnate lobed. The stem much branched and prostrate. The sepals roundish, with white.
mambruous margins. This plant was formerly gathered and eaten as a salad, but it has since been reasonably neglected, as it is acrid and unpleasant, and must require much boiling to render it edible. It is native of Europe, North America, and Central and South America.

S. didyma, has a pouchouchted by two wrinkled lobes, an extremely short style, and pinnatifid leaves. The stem is spreading, about a foot in length. The flowers small and white, and the calyx 3-cleft. It is found on waste ground near the sea in Great Britain.

S. nilotica is eaten as a salad in Egypt. As these plants possess no beauty, they are not worth cultivating except in botanic gardens.

(Don, Gardner's Dictionary: Babington, Manual of British Botany.)

6. SEPARATION. [JUDGMENT, P. C. S.]

SEPARATION. [Wright, P. C.]

SEP'TA'RIA, a genus of acanthus mollusks, belonging to the family Tubicidae, in the arrangement of Lamarck, who defined the shell thus:—Tube testacea, very long, gently attenuated posteriorly and divided internally by arches, in complete partitions. Anterior extremity terminated by two slender tubes, which are not chambered in the interior. The Septaria arenacea is the type. It is the same shell described and figured by Dr. M'Intosh of India, a transliteration of two of his Travels into Africa, under the name of Teredo gigantea. It lives in sand in the Indian seas. A second species, unknown to Lamarck, lives in the Mediterranean, and has been described by Dr. M'Intosh in a letter written to Dr. Barnaby, and similar to that of Teredo. M. Deshayes considers the two genera identical, and his opinion will probably be hereafter adopted by most naturalists.

SEQUESTRATION. [Benspice, P. C. p. 281.]

SEQUESTRATION (Scotland). [Bankruptcy, P. C. S.]

SERAMPORE MISSION. A brief account of the origin of the Baptist Missionary Society, and of the history of this case, one of the most prominent events of the last year, having been given under Missions, P. C. p. 237, an article under this head is chiefly required to supply the omission in its proper place of a memoir of William Carey, D.D., its principal founder and leader.

Dr. Carey was the son of a master of a small free-school at the village of Paulerspury, in Northamptonshire, where he was born on the 17th of August, 1761. Even in childhood he was remarkable for his intense love of knowledge and ardour in its pursuit. He was apprenticed to a shoemaker at Hackleton, but becoming early the subject of deep religious impressions, he began to preach about the age of twenty, and, without entirely giving up his business, settled at Moulton, in his native county, as pastor of a small Baptist church, whence, in 1789, he removed to Leicester. It was during his residence in obscurity at Moulton that Carey wrote the work which has been the foundation of his fame, and which has brought him to an important degree, to the formation of the Baptist Missionary Society; but it was not published until some years after it was written, it being found difficult to excite even ministers to interest themselves in the cause of foreign missions. The circumstances attending the organization of the society need not be repeated here, but we may state, as an indication of the difficulties to be overcome by its first agents, especially in consequence of the opposition of the East India East India Company to any efforts for the evangelization of Hindustan, that Carey and his companion, Mr. Thomas, were, before the ship in which they set sail (finally left the coast of England, by a late and unceasing struggle, in consequence of threats held out in an anonymous letter which followed the captain; and were thus compelled to take passage in a Danish ship, which was not under the Company's control. For some months after their arrival at Calcutta the missionaries endured great trials, and they were at length compelled to accept engagements to superintend indigo-factories in the vicinity of Mulla, sparing what time andmoney had been assigned to the promotion of their primary object. In 1715 Carey began the work of Bible translations, and in 1799, in that year he removed to Kidderpore, he bought a press and printing apparatus. A third missionary had been sent out in 1799 to join Carey and his fellow-labourer; and in 1799 four missionaries who included Mr. (afterwards Dr.) Marshall, and Mr. Ward, who had been brought up to the printing business, and to whom Carey had, when leaving England, expressed a hope that he might join the missionary profession of the necessity which might arise for practical knowledge of the art, were sent out. As the East India Company would not allow them to settle as missionaries in their dominions, the mission establishment was, about the time of their arrival, removed from Kidderpore to the Danish settlement of Serampore [Serampore, F. C., p. 252], where for many years the work of translating and printing the Scriptures in several languages, various languages of Hindustan was carried on with surprising energy. It appears from the appendix to Dr. Tenth Memoir respecting the Translation of the Sacred Scriptures into the Oriental languages, by the Serampore Brethren, which was published in London in 1834, that the translation and printing of the New Testament into Bengali was completed in 1801; and that between that date and the month of July, 1822, the whole of the Bible was rendered into this language. It is either the whole or part into at least thirty-nine other Oriental languages or dialects, 212,656 copies of the New Testament and other portions of the Bible were issued during that time from the Mission press, in addition to many printed for the British and Foreign and some other Bible Societies. During the same period a great number of religious tracts and miscellaneous works were also produced, in several different languages, including a Bengali map of India, a grammar and a two dictionaries, a semi-weekly newspaper, and a Youth's Magazine, in Bengali and English; and, in Bengali alone, several large volumes of Government Regulations, a History of God's Work in India, a Treatise on Anatomy, intended as the first volume of an Encyclopædia of the Sciences, a Treatise on Geography, and a translation of the Pilgrim's Progress. The list of works in Bengali, Sanscrit, Chinese, and other languages comprises also many important books.

In these great undertakings Dr. Carey was the chief director, while a very large proportion of the actual literary labour also rests upon him. In addition to the office of professor of Oriental language in the college of Fort William, at Calcutta, from its establishment in 1800, until its virtual abolition by the discontinuance of the English professors about the year 1830, he enjoyed a pension from government. He died at Serampore on the 9th of June, 1834, in his seventy-third year, leaving some autobiographical manuscripts which have been used by his nephew, the Rev. Eustace Bird, in a memoir, which was published in London in 1836, to which is prefixed a biographical sketch by his son Jonathan, incorporated in the memoir referred to, it is observed that in all objects connected with the general good of his adopted country, Dr. Carey took an active part, and that he prepared, under the direction of a noble lady then resident in India, the prospectus of an agricultural society in the East, to which was united an horticultural society, of which he was a member, and in the affairs of which he took a lively interest, till his last illness; and he had the gratification to see that the society became at length the most flourishing and interesting society in the East, in which the first distinction of the country, united, and which still continues to maintain the country, united, and which still continues to maintain. A very favourite study with Dr. Carey, whose share in the publication of Biblical and other books in India was very great, was the study of the Rožburg, F. C., p. 197. 'In the Asiatic Society,' continues his son, he also took an active part; and for many years, up to his death, was one of the members of the committee of papers, and afforded considerable information, and in various ways promoted the general interests of the institution.' At his death, he adds, 'the Bishop of Calcutta, in a speech, passed the highest encomiums on the character and talents of Dr. Carey; and a minute was recorded expressing the loss sustained by the society, and their regret at the removal of one of its most excellent members.'

From Remarks on the Character and Labours of Dr. Carey, as an Oriental Scholar and Translator, by H. W. Wilson, Esq., Boden Professor of Sanscrit in the University of Oxford, which is also appended to the Memoir by Eustace Carey, we select the following sketch of his more important and legitimate labours. 'At the time when Dr. Carey commenced his career of Oriental study, the facilities that have since accumulated were wholly wanting, and the student was destitute of all elementary aid. With the exception of the Serampore works, which were produced by the natives of India as sacred and classical, such as the Arabic and Sanscrit, few of the Indian dialects have ever been reduced to their elements by original writers. The principles of their construction are preserved by the grammar or vocabulary forms no part of such scanty literature as they may happen to possess; accustomed from infancy to
the familiar use of their vernacular inflections and idiom, the natives of India never thought it necessary to lay down rules for the pronunciation of the Bengali tongue; and even in the present day they cannot, without difficulty, be prevailed upon to study systematically the dialects which they daily and hourly speak. Europeans, however, are differently circumstanced. With them the art of speaking the Bengali tongue is a sufficient critical knowledge of a foreign tongue. But when the Oriental languages first became the subjects of investigation, those precepts were yet to be developed, and the early students had, therefore, as they gathered words and phrases, to investigate the principles upon which they were constructed, and to frame, as they proceeded, a grammar for themselves. The talents of Dr. Carey were, he adds, 'eminently adapted to such a task': Mr. Wilson says, 'it was impossible to state that Carey's Sanscrit grammar was the first complete one published, his Telinga grammar the first printed in English, his Karnata and Marattas grammars the first published works developing the structure of those languages, his Marattas dictionary one of the first attempted, and his Punjabi grammar the only authority for the language of the Sikh nation; and although, he remarks, 'he must concede to Halhed the credit of first reducing to rule the construction of the Bengali tongue, yet by his own grammar and dictionary, and other useful rudimental publications, Dr. Carey may claim the merit of having raised it from the condition of a rude and unsettled dialect into the position of a regular speech, possessing something of a literature, and capable, through its intimate relation to the Sanscrit, of becoming a refined and comprehensive vehicle for the diffusion of sound knowledge among the Hindustanis.' Some of the works were referred to were of great extent; the Sanscrit grammar, for example, comprising upwards of 1000 quarto pages, and the Bengali and English Dictionary, published in 1815 and 1825, in three volumes, upwards of 2000 quarto pages, and about 50,000 words. An abridgment of the latter work, prepared by Dr. Marshman under the supervision of Dr. Carey himself, was published in 1827 in one thick octavo volume. One of the early and important productions of the press was 'The Ramayána of Valmiki, in the original Sanscrit, with a Prose Translation, and explanatory Notes,' edited by Drs. Carey and Marshman, of which four quarto volumes were published, in 1806 and subsequent years, under the sanction of the Asiatic Society and the Council of Fort William College, but which, unfortunately, was never completed.

It may, at first sight, excite some surprise that the Serampore missionaries should, in some instances, have issued translations in languages or dialects with which none of them were fully acquainted. In this department, observes Mr. Wilson in explanation, 'Dr. Carey took a leading part, and it was in connection with his duty of superintending the translations that he added to his great proficiency in Sanscrit and Bengali, a knowledge of those dialects whose elements he first investigated.' Possessed in this way, he states, 'of at least four languages, and distinct dialects, and of Sanscrit the whole family, and endowed with a genius for philosophic investigation, Dr. Carey was peculiarly qualified to superintend the translation of the Scriptures into a number of cognate languages,' and that 'he was not an error. In connection with his colleagues, he carried the project to so successful an issue as could be expected from the bounded faculties of man.'

In the above sketch of the labours of Dr. Carey frequent allusion has been made to JOSHUA MARSHMAN, D.D., perhaps the most eminent of his colleagues, but of whose particular share in the great undertakings of the Serampore Brethren, as the band of missionaries among whom he and Carey were the most prominent often styled themselves, it is not necessary to give any account. From a statement in the 'Baptist Magazine' for April, 1858, it would appear that he was born in 1767. As before stated, he embarked for India in 1796. In 1826 he visited England on the subject of the disagreement between the Serampore Brethren and the Baptist Missionary Society, which led to their separation in the following year: his son John having previously visited England in 1823 on the same business. In this disagreement, which arose about 1817, the uncompromising and somewhat impracticable spirit of this otherwise excellent man, appears to have had considerable influence in removing the Serampore missionaries from India; he resided there a few years, and remained there till his death on the 5th of December, 1837, a few days previous to which event arrangements were concluded in London for the re-union of the Serampore Mission with the parent society, and for retaining him in the superintendence. In a sketch of his character at the end of the first volume of Dr. Cox's 'History of the Baptist Missions in India,' Dr. Marshman 'is described as the most melioral, power and diligence, of firmness bordering upon obstinacy, and of much warmth. Dr. Marshman's name is especially known by his controversy with Rammohun Roy (Rám- missionaries, in which he was greatly among his countrymen in India by his spirited attacks upon idolatry, and by the publication of a work entitled 'The Precepts of Jesus, the Guide to Peace,' in which, while exposing the precepts, he expresses the miracles of Christ, Dr. Marshman answered this work by a series of articles in the 'Friend of India,' a periodical issued by the Serampore missionaries, which were subsequently republished in London, in 1826, and by Mr. Wilson in the 'Journal of the Deity and Atonement of Jesus Christ, in reply to Rammohun Roy, of Calcutta.' In 1824 appeared a second London edition of Rammohun Roy's work, illustrated with a portrait of the author, and containing replies to Dr. Marshman.

Of the history of the Serampore Mission itself little more need be said. The leading facts are given under MISSIONS, P. C., to which we may add, that although Serampore had been selected as an asylum from the opposition of the East India Company, the missionaries were not disturbed when shortly after their settlement, the place came into the hands of the British Government; its mission establishment has been removed from Serampore to Calcutta, where a handsome printing-office and other premises have been erected. About 1840 the British and Foreign Bible Society began to publish the Bible, which was at first issued by the Serampore mission, public attention having been drawn to the fact that in those versions the words signifying baptism had been so rendered as to distinctly imply the performance of that rite by immersion; and in consequence of this withdrawal of support a new society was formed, under the name of the 'Bible Translation Society,' to provide for the continued maintenance of the Serampore versions, and, in 1842, the London Missionary Society began to encourage the production and circulation of complete translations of the Holy Scriptures competently authenticated for fidelity, it being always understood that the words relating to the ordinance of baptism should be translated by terms signifying immersion.' The question which led to the establishment of this new society occasioned a great deal of controversy, in the course of which there appeared a 'Letter to the Rev. A. Brandram, M.A., on the meaning of the word βάπτισις, and the manner in which it has been rendered in Versions sanctioned by the Bible Society,' by the Rev. F. Henderson, D.D., of Highbury College, in which the whole question of the translation of this word is admirably and learnedly illustrated. This pamphlet was reprinted verbatim in the 'Evangelical Magazine' for June, 1840. From the sixth annual report of the Bible Translation Society, presented to the annual meeting of that body in 1842, it appears that 11,000 copies of the whole or parts of the Scriptures had been printed, and 54,000 copies distributed, in the preceding year, in the Oriental versions; and that the total number printed since 1836 was 188,000. Serampore was closed in 1848.

SERAPHINE, a musical instrument of the keyed kind, recently invented, and may be described as a small organ, in which very short, thin, and narrow steel bars, or springs, put into vibratory motion by means of a bellows acted on by the foot, are used instead of pipes. The principle on which this instrument, as well as every variety of it, is constructed, has been explained under the word ACCORDION, P. C. S., and referred to under the term CONCERTINA, P. C. S. Nothing therefore remains to be added, except that the Seraphine is in the form of a cichofoner, about thirty-seven inches high, forty wide, and twenty-two deep. Its compass is five octaves, including all the semitones, and it is played on in the same manner as any other keyed instrument. It combines the advantages of both organ and pianoforte, by affording the means of prolonging the sounds, the strength of these by the more or less pressure of the fingers and the bellows, while further power of augmenting the loudness is obtained by a pedal acting on the swell. The effect of the bellows, however, is small, and even when very strong, a double bellows, or a skilful player are as surprising as various; and its convenient form, moderate price, together with its invaluable property of standing in tune—perhaps we might say of never going out of tune—are such additional recommendations of the Seraphine, that, we are
Sergell, Johann Tobias, an artist for whom may be claimed the high merit of having commenced that reform in modern sculpture in which he was followed by Calympus, Thorwaldsen, Thorvaldsen, and Anselmi. He was born at Stockholm on the 8th, 1740, and was the son of a gold-foace maker and embroiderer. He himself was at first apprenticed to a stonemason, and worked as such at the royal palace at Stockholm, which was then in repair; and it is no wonder that his early training attracted the notice of the sculptor Larchevaque, who was taken by him as a pupil. After assisting him in modelling the two statues of Gustavus Wasa, and Gustavus Adolphus, Sergell was commissioned to go to Rome, where he remained nearly twelve years, and produced many works that excited general admiration among the professors and patrons of art. On quitting Italy he visited Paris, where his & 'Othryades,' a figure of a wounded Greek soldier, half life size (afterwards placed in the Luxembourg) gained him the appointment of the Academy of Fine Arts. From Paris he proceeded to London, whence he was immediately summoned by Gustavus III, who conferred upon him the post of court sculptor. In 1784 he accompanied that monarch in his visit to Rome; and it was by his advice that Gustavus there purchased among many other valuable works of art the celebrated 'Endymion,' for the royal museum at Stockholm.

Catherine II. was afterwards desirous of securing his talents in her service, and Sergell, as the most celebrated of sculptors, but though with as well as distinction availed him at St. Petersburg, Sergell's attachment to his sovereign and his native land, and his indifference to riches, induced him to remain in Sweden with only certain annuities, and a pension of six hundred rix-dollars. The untimely end of Gustavus, whom he regarded rather as his friend than his master and patron, so affected him that he fell into a deep melancholy, and was for a length of time wholly incapable of doing anything in his profession. It was not till a few years before his death that he regained something like his wonted composure of mind, but it was then almost too late for him to think of retrieving the time that had been lost to art. He died at Stockholm, February 26th, 1814, in his 74th year.

Sergell's works are distinguished by vigour of conception, by energy and grace of style, and by perfect freedom from that mannerism and sickly affectation into which sculpture had fallen in the hands of his immediate predecessors and contemporaries. Among his principal statues are the group of Cupid and Venus, Diomede carrying off the Palladium, Othryades, a Faun, Gustavus III., Orestes dictating to the Muse of History the deeds of Gustavus Adolphus, Mars and Venus, a Venus Callipyge, most of which are in the royal museum. One of his finest productions, a composition in alabaster of a man sitting at a table, windows or open doors behind, which has been called jaeger, is the only one in the model, having never been executed in marble; as was the case with a number of other subjects. His busts and portrait medallions were highly esteemed, both for form, and there being no feeling of goldsmithing in the work, the present eminent Swedish sculptor, was a pupil of Sergell's.

Conversations-Lexicon der Gegenwart; Biographie Universelle.

SEUPELITES, a genus of annulo? (foalins from the Silurian strata of Salop, &c. (Murchison.)

SEWAFALCUS, a genus of grases belonging to the tribe Festucinae. It has unequal heraceous many flowered glumes, the lower are from 4 to 6, the upper 2 to 3. The flower is oblong and trilobed. The outer palea with a short seta formed on three nerves from below the tip. The styles lateral below the summit of the fruit. The spikelets narrow, elongated.

S. cerealis has a loose panicule slightly compound, the simple peduncles being about equaling the oblong glabrous spikelets, the flowers at first loose, irregular, afterwards, distinct, about 4. The fruit is long, covered by the bell of the next flower. The flower is large and downy, the leaves hairy with nearly smooth sheaths. It is native of Great Britain.

S. rustica has a close or elongated erect panicule usually simple, the spikelets glabrous ovate and somewhat compressed. The midrib of the glumes and paleas scabrous towards the top, the leaves and sheaths slightly hairy. It is a common species of Europe, from England to Russia. (Bevington, Manual of British Botany.)

SERRICORNES (Insects), the third family of Penta-
The English system. [WAT. P.C.] The personal servitudes of the Roman law do not correspond, except in some few cases, with any thing in the English law, except limited enjoyment.

[UNTEXTURED, F.C.] The subject of the Roman servitudes would require a long exposition to be treated fully. A good outline is contained in a treatise by van der Ponds in the Bodenbear, i. p. 226, &c., 12th ed.; and in Mackelvie, Macbruch, &c., ii. p. 974, 12th ed.

SUPPORTS, a genus of grasses belonging to the tribe Sessiariaceae. It has a spiked panicle, secale spikeslets tiled all round. The glumes are from 2 to 3 times as long as the spikelet.

S. coriaceus has an ovate slightly one-sided spike, the outer palae terminating in 4 teeth, the dorsal rib rough, with a short excorticate point, the leaves abrupt, with a minute rough point. The roots are tufted, the stem from 6 to 12 inches high. The spike about 3 inch long, and of a bluish-purple colour. This is the only British species. It is found chiefly on mountains.

S. quineta is the Festuc quinetae of Humboldt and others. Humboldt tells us that it is very poisonous.

[LINDLEY, Flora Medica; Babington, Manual of British Botany.]

SESSION, COURT OF, is the Principal Tribunal of Civil Jurisdiction in Scotland. As at present constituted it dates back to the year 1552; but it was then reconstructed on the basis of institutions which had existed at a much earlier period. The early records of the Scottish Parliament show that there was some authority, which in some instances was more or less systematic and legislative function, that of body, was often debased to committees. These were termed Dominii Auditories, or Dominii ad Querellas, and received other like titles.

We find these commissions and their functions to have been of a more distinct position in 1503, when a permanent body received the designation of The Daily Council. It is worthy of observation that these incidents in the history of the court establish a connection between the judicial system and the Court of Session, while in early times it is known to have belonged to the courts of the inferior judges. Parliament being the high jury of the nation, it would be an anomaly that a committee of that body should act through the aid of a jury. The number of the court as finally established in 1552 was fifteen, the usual number of a Scottish jury in former times, and still the number of a jury in a criminal prosecution.

There was then a Lord Chancellor of Scotland, whose functions in some degree resembled those of the same official in England. He presided over the Court of Session, and his judicial functions gradually came to be absorbed in those of the union with England. It was deemed necessary to retain a separate chancellor of Scotland, and the great seal to be appended to private documents for that part of the country being committed to a keeper, the court was presided over by the Lord presiding, or present, in the absence of the chancellor. In 1808 the Court of Session was divided into two divisions: the head of the court, the lord president, who is also now lord justice-general or head of the supreme criminal court, presides in the first division, and the lord justice clerk, or deputy head of the criminal court, presides in the second. In 1815, trial by jury in civil cases on the English system was introduced in Scotland. A separate tribunal was established for jury cases, presided over by a Lord Chief Commissioner, but in 1830 the practice of jury trial was united with that of the Court of Session. It is still tried in a limited number of cases, and far from being popular or satisfactory. The Scottish system of pleading is ill adapted to it, and no means have been found of carrying it through with the promptitude and precision which mark the English practice. In this respect benefit has been in enforcing the separation in all pleadings of the facts stated from the law applied to them. In 1830 two separate courts of limited jurisdiction and small practice—the Admiralty and Commission courts—were established in the Court of Session, and the number of judges was at the same time reduced from fifteen to thirteen. By this measure the court was made to assume less the form of a deliberative assembly acting through a small number of judges, and the particular character of the court before it was divided, and more judicial work was thrown upon individuals. By the act of 1830 (2 Geo. IV., and 1 Will. IV., c. 69.), as carried out by a later act (1 & 2 Vict. c. 118), eight of the judges, formed into two courts of four judges each, sit in the two divisions of the Inner House, where each division forms the court of a second instance. The other five judges are called the Lords Ordinary, and each selects, with the consent of the other four, a separate court, with which he sits in the court of further resort is called the "Outer House." The judgment of a lord ordinary on a closed record is final in the outer house, but it may, within a limited time, be carried to the court of the Inner House, where a final judgment is given. The system of pleading has of late years been much abbreviated and systematised, and the judges, added to the reduced number of judges who sit and give their views on each case, has materially abbreviated the procedure, although it is still the practice for the whole court to be assembled and consulted in difficult cases. The Court of Session is the highest Court of Civil Appeal in Scotland, and the Court of Session is the Court of Session of civil right. It gives remedy when other courts whose function it is to regulate the rights and duties of certain sections of the public as members of a particular class—such as courts martial and ecclesiastical—exceed their powers. The proceedings before the Court of Session in relation to the church courts, were the cause of the great secession from the Scottish church in 1843 [Fair Clackum, F.C.]. As every description of civil question between man and man in Scotland can be competently decided before the Court of Session, it is usual in England to speak of it as a court 'both of law and equity'; but this is a distinction proceeding from incipient and artificial causes, and the Court of Session is in no necessary or proper systematic division of the administration of the law. The Court of Session have the authority enjoyed by the equity courts in England, in the appointment of guardians, and in respect of the protection of property, or of persons where discretionary protection or direction are necessary, and there is no person competent in ordinary course of law to act. In 1839 (2 & 3 Wm. IV., c. 46.), the judges of the Court of Session were appointed according to a certain rotation to perform the duty of judges of the court of justice in matters criminal, and in September of that year, a new practice was adopted by the system of rotation in the performance of the duties of courts of which certain of the lords of session had previously been permanently appointed the judges. By an old practice in Scotland each 'Senser of the College of Justice,' as the judges of the Court of Session are officially called, takes the title of lord.

SESSIONS. The criminal jurisdiction of justices in rural and quarter-seasons is now defined by the 5 & 6 Vict. c. 38, which enacts 'that after the passing of this Act neither the justices of the peace acting in and for any county, riding, division, or liberty, nor the recorder of any borough, shall at any time hereafter sit as a court of justice on the trial of any person or persons for any treason, murder, or capital felony, or for any felony, which, when committed by a person not previously convicted of felony, is punishable by transportation any person for any such offences as are punishable under the 18 heads contained in the first section of the act. The second section provides that any judge of the supreme courts at Westminster, acting under a commission of oyer and terminer and gaz delivery for any county, may, by a writ or writs of certiorari or other process directed to the justices of the peace acting in and for such county, or, to the recorder of any court within the same county, commanding the said justices and the recorder severally to certify and return into such court of oyer and terminer, &c. and all indictments and presentments found or taken by such justices or recorder of offences which after the passing of this act they will not have jurisdiction to try, and the several recognizances, examinations, and depositions relative to such indictments and presentments; and, if necessary, by writ or writs of habeas corpus may cause any person in the custody of any gaol or prison, charged with any such offence, to be removed into the custody of the common gaol of the county, that such offenders may be tried under the said commission. The fourth section empowers any court of general or quarter-seas or adjourned quarter-seas courts, within any county in Scotland, to try such crimes as the said justices or recorder may certify, and return into such court of oyer and terminer, &c. and all indictment and presentments found or taken by such justices or recorder of offences which after the passing of this act they will not have jurisdiction to try, and the several recognizances, examinations, and depositions relative to such indictments and presentments; and, if necessary, by writ or writs of habeas corpus may cause any person in the custody of any gaol or prison, charged with any such offence, to be removed into the custody of the common gaol of the county, that such offenders may be tried under the said commission. The fourth section empowers any court of general or quarter-seas or adjourned quarter-seas courts, within any county in Scotland, to try such crimes as the said justices or recorder may certify, and return into such court of oyer and terminer, &c. and all indictment and presentments found or taken by such justices or recorder of offences which after the passing of this act they will not have jurisdiction to try, and the several recognizances, examinations, and depositions relative to such indictments and presentments; and, if necessary, by writ or writs of habeas corpus may cause any person in the custody of any gaol or prison, charged with any such offence, to be removed into the custody of the common gaol of the county, that such offenders may be tried under the said commission.'
history, with specimens of his works, may be gathered from various parts of Scott's edition of the works of Dryden. Settle, born in 1648 at Dunstable, was entered a commoner of Trinity College, Oxford, in 1666, but left the university without a degree, and came to London in 1668, as an adventurer. He first rose to note in 1671, by the success of his tragedy of 'Cambyseus'; and the prolific Rochester, desirous to humble Dryden, eagerly adopted the new dramatist as a brother to Settle, next tragedy, 'The Empress of Morocco,' composed by an unclesorous patron enjoyed the honour (never vouchsafed to Dryden, the laureate) of being first acted at Whitehall by the lords and ladies of the court; on being transferred to the theatre it was acted to full houses into the second month successively, and copies of it were sold for double the usual price; and the author, intoxicated by his undowered success, precipitated to it a vamping produce; animadverting severely on his rival. Dryden, alarmed and jealous, assailed Shadwell and Rowe in writing scurrilous 'Notes and Observations' on the play, the author answered in the same strain. Political differences obliterated the quarrel begun. But poor Settle's fame was short-lived; and Dryden had little cause to fear him when he was so ill-advised as to advocate the cause of his whig patrons, by publishing, in answer to the 'Abasmon and Achitophel,' a poem entitled 'Abasmon Senior, or Achitophel Transposed.' Not a few thought it a僬worthy of punishment; and, under the name of Doeg, Elkanah became the victim of some of those contemptuous verses which Dryden contributed to the second part of 'Abasmon and Achitophel.' Settle retaliated for the slight, but the lightness of his smoothness of versification, his bombast, and his real poverty, both of thought and fancy, may be accepted as no unfair criticism on his works in general.

Drye, though without knowing her or why,
Made all a trembling kind of melody.
Sagged and stretched and thonged through and thin,
Through sense and nonsense, never out nor in;
Free from the several, weak and false, or bad,
And, in one word, heroically mad.

Down to this time Settle had been a trusted servant and pamphleteer of Shaftesbury and the other whig leaders; and in November, 1690, he superintended with much approbation the burning of the press at Bath. Soon afterwards however he suddenly changed his party, recanting his political heresies in a narrative which he published in 1693. By this change he perhaps preserved for the time his place as poet laureate for the city, and writer of verses for pageants and other civic festivities; but with the revolution his prospects were completely blighted. Although he retained his place as city-poet, he was reduced to great poverty. He had literally to suffer the fate satirical poets are so apt to take. In 1693 he went to London, where he shows at Bartholomew fair in Smithfield; and in one of these he actually performed in person the part of the Dragon slaughtered by St. George, a fact which Pope has charitably interpreted as an allusion to his age. In 1720, having heard that with the aid of some friends he was to act in the Charter-house, and died there in 1723. He was the author of sixteen original plays that were printed, and of a good many occasional and political pieces.

SAX. [Tunis, P. C. p. 469.]

SHAGNAN is a country in Asia, situated in the Upper Valley of the river Oxus, where that river has not yet left the mountains, which enclose the upper part of its course. It lies between 37° and 39° N. lat. and between 70° and 72° E. long., its eastern and western boundaries are impassable known; the river Oxus which runs along its southern and western boundary, divides Shaghan from Badakshan. As the head of this river in these parts, where it is called Jang, is several thousand feet above the sea-level, its course is extremely rapid, which renders the access to Shaghan from this side, very difficult, and for the greater part of the year impossible. The country is traversed by numerous elevated ridges, which are covered with snow for the greater part of the year. These ridges are at their eastern end connected with the immense mountain masses which surround the elevated table-land of Pamir, on which the Oxus originates in the lake of Sir-i-kol. It is true, but its snow is so deep that the climate they do not affect the surface of the land. The greater part of the population subsist on the produce of P. C. S. No. 163.
fastening the sheathing; and the heels of the nails employed are made hollow, and filled with melted zinc. This method in itself has been found effectual in a vessel which has been two years at sea, the corrosion or oxidation of the metal being almost entirely prevented, and the ship returning with a bright and clean surface.

The paper coated with tar, and of various other non-metallic substances, have also been used, and perhaps the most important of these is a kind of felt, into the composition of which a considerable quantity of cow-hair enters. As this material itself feels very imperiously, the sheets are passed, in the process of manufacture, through a boiler of pitch or tar, which increases the cohesion of the fabric. This material, which is sometimes used in conjunction with copper shot, is being laid on immediately beneath the has, according to Barlow ('Treatise on Machinery and Manufactures' in the 'Encyclopedia Metropolitana') the important qualities of being a perfect protection against the worm, which is probably incapable of working its way against the stiff bristly hair which is incorporated in the felt, and of being at once impermeable to water, and so extensible as not to be easily broken by the working which takes place among the timbers of a crazy ship, and which would otherwise produce many leaks. A sheathing composed of a coarse fabric of fibrous material, saturated with a solution of caoutchouc, together with pitch and tar, has been recommended as a cheap and effective felt.

Copper sheathing is usually applied in sheets about four feet long and fourteen inches wide, the thickness being such that a square foot weighs from sixteen to thirty-two ounces,—more than twenty to twenty-four cubic inches of copper; and although the mode of application does not vary materially whether the copper be laid upon the bare planking or upon an interposed layer of tarred paper, felt, or thin boarding. The sheets are pierced with holes, not only round the edges, but also at intervals of three or four inches over the whole surface; they are laid so as to overlap each other about an inch, and are secured to the ship with flat-headed copper nails. 'Great regularity characterizes the author of the 'Sheathing a Ship-Yard,' 'Penny Magazine,' No. 593, 'is observed in the arrangement of the sheets, so that a certain symmetry of appearance, as well as durability, is attained.' After two voyages to the East Indies, according to this authority, 'the coppering requires to be renewed; and the old copper is found to have lost three or four ounces of its weight in the square foot, by the action of sea-water, friction, and other causes.' It may be mentioned as an illustration of the perfect arrangements of a first-rate ship-yard, that a vessel is frequently stripped of her old copper, the surface of the planking prepared for a new sheathing, and sent out thoroughly new; and it is understood that what's entered the dry-dock in which the operation is performed.

SHEERS, or SHEARS, a contrivance used for hoisting the masts of a ship into or out of their place, and occasionally for hoisting heavy gourds or for performing similar operations on shore. The sheers used in masting vessels consist of two large poles, masts, or spars, the lower ends of which rest upon thick planks laid along the sides of the vessel; the upper ends are attached by ropes or by cross each other exactly over the hole in the deck through which the mast is to be dropped, they being sustained in this position by ropes radiating from the top to various parts of the vessel. To this apparatus is attached the tackle necessary for lifting the masts out of the water, when they have been floated to the side of the ship, and lowering them gently into their places. This is the apparatus commonly employed in masting merchant-ships; but the like operation is sometimes performed by means of a sheer-hulk, and sometimes by a masting-house. The sheer-hulk, which is commonly used for masting ships of war, is an old man-of-war cut down to the lower deck, and having a mast, a hundred and twenty feet in length, fixed in the hull, and, supported by the mast, four stout spars or sheers which project obliquely from its side. The tops of these sheers reach to such a height and project to such a distance from the side of the hull, that the vessel to be mastied can come beneath them to be fitted with her lower masts. A masting-house is a lofty building erected for the purpose of performing the operation yet more conveniently, by the aid of a crane and a long series of hoisting-heavy ropes or of draw-sheets, this very considerable distance, beneath which ships may be floated. Such a structure, of great elevation, forms a conspicuous feature of the great ship-building establishment on the Thames at Blackwall.
SATENT STATE OF THE LAW. The act above referred to, gener-
ally called the Jurisdiction Act, was passed for the purpose of
abolishing all those remants of the feudal courts of Scot-
land which were hereditary, or in any other shape of the
nature of property; of bringing all judicial offices within the
appointment of the Crown; and of giving the Crown the exclu-
sive authority and control over the administration of justice.

At the present day, however, there still remain in the
Wirtemberg and the larger counties there are two or
more. Both the sheriff and his substitute are lawyers, but
the latter is the local resident judge, the former generally fre-
quently performs the duties of the sheriff, where he hears appeals
from his substitute, and making occasional visits to his
county. By the Jurisdiction Act it was provided that
such sheriffs should reside in his county during four
months in the year. This provision was for
the sheriff's office to continue as practiced at
the bar to remain in Edinburgh, while the greater portion,
who had given up or had not obtained practice, resided at
their husbands, by the operation of a statute already men-
tioned. This circumstance was the object of much animadver-
sion by the friends of law reform, and a wide difference of
opinion was expressed on the matter, some maintaining that the
sheriffs were unequally chosen, serious consideration, while, in the words of the Report above cited, the
former (who is styled Sheriff Depute) in Edinburgh was in
some degree countenanced by high legal authorities, who con-
sidered the influence and prestige of the city, and of its
court, as an important factor in the
session, during the sitting, to be more useful than a literal
adherence to the statutory rule. It has been supposed that
such an attendance tends both towards a higher degree of legal learning among sheriffs and practice,
being promoted by their occasionally consulting each other.

It was very clear, however, that it was disadvantageous to the
public that there should be any of those judges who neither
reside within their counties nor at any time lose sight of what
the others ought to be. The incumbents receive much
higher salaries than the other sheriffs, and have their time
fully occupied. It has been held that, in regard to the other
considerations, the sheriff in Edinburgh is peculiarly
able to have business at the bar, and giving them duties which
only occupy part of their time, and salaries for which they
would not generally agree to give up their profession, it would
be wise to unite several counties together, and employ law-
ners with salaries equal to the full value of their whole time,
to these enlarged districts. These various opinions were very
actively discussed from ten to fifteen years ago, but it is now
prettv clear that it is in the persons of the sheriffs-substitute,
or permanent local judges, that the public look for the benefi-
cial working of the system. In civil questions an appeal
lies (without new pleadings) from the sheriff-substitute to the
sheriff, but where the former is a solicitor, and an
industrious man, the privilege is seldom used. The salaries of the
sheriffs-substitute have lately been raised, according to
a sound policy advocated by many of the most cautious and
economical politicians in the country; they average at present
about 450L. The salaries of the principal sheriffs vary widely,
but the whole amount of their aggregate incomes, as returned
to parliament in 1843 (Parliamentary Papers, 270), when
defaulters in numbers, given 591 to each.

From the state in which the profession of the bar of Scotland has
been for the past ten years, several of its members have been
induced to accept the office of sheriff-substitute as vacancies
have occurred. The number, given 591 to each.

SHIKARPORÉ is a commercial town, in the province
of Sindé, in 28° 39' N. lat., and 69° 30' E. long. The
town is built on the left bank of the river Indus, and
the waters empty into the Hala Mountains, and about 26 miles from the
western bank of the river. Though more than 250 miles from the
sea, it is only 250 feet above the sea-level. The
city is enclosed by a space of 3983 yards in circuit. They are
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built of unburnt brick, but have entirely fallen to decay, for want of repair. They have eight gates. The houses are also of unburnt brick, and have more than one floor; those belonging to the soucers or bankers are of a respectable size, and convenient. The streets are narrow, confined, and dirty in the town; but in the great bazaar, which is the centre of all trade and banking transactions, extends 800 yards, running immediately through the centre of the city. It is protected from the excessive heat by mats stretched from the houses on each side, which produces a stagnation of the air. With the exception of one tolerable moshui on the southern side, Shikarpore possesses no building of importance. The suburbs are very extensive, and a great portion of the population are obliged to live outside the city, particularly the Mohammedans and labouring classes.

The population of Shikarpore, in 1840, consisted of about 30,000 individuals, of whom about two-thirds are Hindus, and the remainder Mohammedans, inclusive of Afghan and Patans. The Hindus carry on all the trade, while the cultivation and mechanical arts of almost every denomination are in the hands of the Mohammedans.

The country round the city is low, and admits freely of irrigation from the inundations of the river Indus by means of small nullas, or water-courses, leading from the Sind Canal. This canal was made by the Mogul emperor for the purposes of irrigation and navigation. The Sind, in its present state, is only navigable from the end of April to the beginning of October, as it has been allowed to ebb up at its mouth, and has generally got out of repair. But it is supposed that at times the river may be rendered navigable for months of the year. The soil in the vicinity of the city is alluvial, and produces rich crops of rice and jowar.

A few articles are manufactured at Shikarpore, but not to any extent, except coarse cotton-cloth, silk-cloth, and Sindu sars. There are also several dyeing-houses, in which cloth made in some of the neighbouring places is dyed and prepared for the market; and there are some paper-mills. This town is the centre to considerable trade conducted between the commercial road between Hindustan, Afghanistan, and Persia, running through it, and leads to the Bolan Pass, which, in spite of its formidable aspect, is much safer than the other roads which connect the valley of the Indus with the territories of Persia, and from this safety has been greatly increased since the British have got possession of the province of Sind, and have suppressed the predatory incursions of the Murries and Boskites, two Belooche tribes who inhabit the mountains contiguous to the pass. The Bolan Pass is also accessible all the year round, and a good road leads from it to Kandahar, and thence to Persia. Shikarpore is as it were built up at the opportunity of the place.

European and India goods are brought to Shikarpore by three different routes. From Caleutta they ascend the Ganges, and are taken to Loordiana, whence they go down the Sutlej, and thence up the Indus, passing through Kyprone. Some of them go from Loordiana to Lahore and Multan. These imports consist of raw Bengal silk, ivory, lacquer, spires of all kinds, coarse cotton cloth, raw Chintz, and silk manufactures, muslin, cotton, cotton, muslin, metal, metals, drugs, indigo, opium, saffron, and dyes. The British textiles fabrics which reach Shikarpore by this route are red-dyed cotton cloth, white cotton cloth, partly-coloured cotton cloth, long cloth, glazed chints, printed, bleached and unbleached cottons, red and white cottons, yellow cotton, Juggernaut muslin, black velvet, shooting cloth, and coloured coarse broad cloth.

The second commercial road connects Central Hindustan with Shikarpore. The goods are brought to Palse in Marwar, situated not far from the Arazvalli range, and are taken through Jullunder and Kyprone to Shikarpore. Only a few articles reach this place by this road, especially sugar, opium, spices, and groceries.

The same articles with European goods are sent from Bombay to Shikarpore by way of Kurache, a sea-port of Sindo west of the Indus. From this place they are transported by land to Sehwun and Larkhana, and then reach Shikarpore. The return of Shikarpore to British India consist of the produce of the country, especially rice, plee, hides, and wool, which is brought from Afghanistan are also exported, and dried fruits.

The exports from Shikarpore to Kandahar and Persia (Herat) consist of indigo, beesw, metals, coarse and fine cotton cloths and calicoes, raw cotton, coarse goods; Mule-cloth, manufactured, piece-goods, spices, raw cotton, coarse sugar, gum arabic, manufactured silk from Herat of various kinds, dried fruits (prunes, dried black grapes, walnuts, dried apricots, almonds, and dates) in great quantities, and also baluchis, olive oil, the (a mixture from the sugar-cane of Jellalabad), broken copper and brass vessels, madder, saffron, safflower, gum salop from Herat, manag, a dye prepared from the walnut-tree, dried mint, caraway-seed, and a very fine description of cotton from Herat, used in embroidery, cochineal, and Uqajand and goodebile, two dyes for silk; the last-mentioned affords a green dye.

From Cutch, a country westward of Shikarpore, are imported slums, cotton goods, and tar, and kar (a kind of potash), produced by the incineration of tamarisk and other salt shrubs. From Bebochistan are brought sauraltan, anemone, slum, and copper.

But Shikarpore is best known in the commercial world by its banking transactions. In 1841 there were in that place thirty-five soucers or bankers, who have agents in all large commercial towns in Western Asia, as far as Bokhara and Kirkand in Chinese Turkestan, and even in Astrakhan and Nishevi Novgorod in Russia. Letters of exchange may be got in all these places payable in Shikarpore, Bombay, and Calcutta.

The climate of Shikarpore is sultry, and the heat excessive from the middle of March to the end of August. There are no periodical rains, though storms are generally looked for at the end of June or the middle of July; severe falls of rain occur at times, but are not considerable. The weather is generally dry and clear, and to this circumstance probably it is to be ascribed that the place is not unhealthy, in spite of the low situation of the town, its being surrounded by stagnant pools close to the walls, and a large space of the adjacent country lying for a considerable period completely under water.

Only for a short period from the middle to the end of September, during which the inundations are drying up, ague in a mild form is not uncommon. The town is frequently swept by a fresh wind in September, and last to the middle of March. Frost and ice are not unusual, and vegetation assumes all the appearance of winter in a northern climate. The mornings at Shikarpore are invariably cold.

Shikarpore is a new town. It was built by the Mogul emperor in 1617, and, as during the last century, since the invasion of Nadir Shah (1739) all the neighbouring countries almost without interruption have been in a state of disorder, the town has never had the opportunity of developing all the advantages of its situation; but as it passed three years ago under the dominion of the British, it is hoped that this change will improve the condition of the place.

(Barrow's Journey through Bokhara; Postam's Memorandum on the trade between the towns of Shikarpore and Kandahar; Postam's Memorandum on the City of Shikarpore, in the Journal of the English and Oriental Societies; On the Commerce of Shikarpore and Upper Sind, in the Transactions of the Bombay Geographical Society.)

SH112S. The different designations which are applied to hunting-stars, according to the lay of meteor of matter, and disposition of salts, are mentioned under SHIP-BUILDING. P. C. p. 396.

SHII [ASTRUMINA, P. C. S.] SHOOTING STARS. The phenomena presented by these meteors, with the different hypotheses which have been proposed in order to account for them, have been noticed under AEROLITES, P. C.; it is therefore intended here merely to state the circumstances which have led to an opinion that the appearances are periodical, and the efforts which have been made, by simultaneous observations on them, to determine the differences between the longitudes of places on the Earth.

On the night of the 11th of November, 1799, M. Humboldt and Bonpland, at Cumania, in South America, observed some thousands of shooting stars in the course of a few hours; and on the same night vast numbers were observed in North America and in Europe. On the night of November 12, 1832, the like meteors were seen in great abundance over all the north of Europe; and on November 12th of the following year, as many as 400,000, according to the computations of Arago, were seen in North America. On the night of November 13, 1834, vast numbers were again observed in America; and on the same day of the same month in the years 1835 and 1836. From these circumstances, and parts of the world was remarkably numerous. Professor
Quetelet, at Brussels, observed, that during the years 1838, 1839, and 1840 the shooting stars occurred on the nights of the 6th and 10th of August more abundantly than on any other nights of the year except the 12th or 13th of November; and it has been observed that since then the sight of the 2nd of June, the 15th of June, and the 6th of December are periods at which the phenomena are, in most years, very frequent. The attention of astronomers has, however, been particularly directed to the 10th of August and the 15th of November as the times at which the recurrence of the phenomena is most probable; but it must be admitted that during the four or five last years the shooting stars have not appeared to be more numerous on those nights than on any other night of the year.

With respect to the use of shooting stars as means of finding the differences between the longitudes of terrestrial stations, the idea was first proposed by Dr. Maskelyne, the astronomer royal, in 1798; and it is obvious that, as their appearance or disappearance is instantaneous to persons stationed at two different places, if it can be ascertained that a meteor observed by persons so situated is the same, the method may become one of considerable utility. The first attempt to ascertain a difference of longitudes by such observations was made in the United States of America in 1835; seven simultaneous observations were made at Philadelphia and New York, on the night of the 10th of November in that year; and the mean of the differences between the times of observation at the two places gave a result which agreed within 1° 2' (in time) with the distance (less 15' longitude) divided by the difference (8h 7m 5s) when determined by other methods. (Silliman's Journal, October, 1840.) On the 10th of August, 1838, twelve simultaneous observations were made at Altona and Breslau, and from the mean by which the value of the difference (8h 7m) in time) between the longitudes of those places, which agrees within one second with the former determinations of that difference. Again, in the same year, the observed times of the first returns of several meteors of different meteors were employed in determining the distance between the meridians of Rome and Naples; and though, on comparing the times of appearance, some discrepancies occurred, yet the times of disappearance agreed simply and directly, and the results gave results agreeing with each other within a few tenths of a second. It is easy to perceive that much uncertainty may exist respecting the precise moment of the first appearance of a meteor, it being scarcely probable that the attention of the observers at different stations should be at the same moment directed exactly to the same point in the heavens.

The impossibility, at present, of anticipating the nights in which the phenomena of shooting stars may be observed, and the small number of observations in which the identity of a meteor is free from uncertainty, are the chief obstacles to the general employment of this method of finding the differences of longitude between terrestrial stations. The number of such meteors do not afford a result on which much dependence can be placed; and a single observation appears to be liable to a risk of error amounting to several seconds of time in comparing different longitudes.

(See Abstracts of the papers, by Messrs. Galloway and Drach, read before the Royal Astronomical Society, in the Monthly Notices for January, 1841, and December, 1841.)

SIDDALIA (in honor of Robert Siddall, formerly Professor of Physics at Edinburgh), a genus of plants belonging to the natural order Rosaceae. It has a concave 10-petalled calyx, the five outer segments accessory. It has 5 yellow or white petals, 5 stamens, and a lateral style. The fruit contains numerous small seeds. S. procumbens has trifoliolate leaves, wedge-shaped leaflets, with three teeth at the apex, rather pilose, the flowers corolline, petals yellow, small, shorter than the calyx. It is found on dry mountains in Scotland, in Europe, Siberia, and North America.

S. peregrina is a native of Cappadocia. It has trifoliolate leaves, the leaflets beset with spiny pili on both surfaces, the flowers corolline, petals yellow, small, shorter than the calyx. It is found on dry mountains in Scotland, in Europe, Siberia, and North America.

(Don, Gardener's Dictionary; Babington, Manual of British Flora.)

SIDDONS. MRS. SARAH, was born at Drexel, in South Wales, July 8, 1753. She was the eldest child of Mr. Roger Kemble and Sarah his wife (whose maiden name was Ward), and, while a mere infant, made her first appearance on the stage on the occasion of her father's benefit. The audience expressed their disapprobation of what they considered too precocious an exhibition; but Mrs. Kemble boldly led the child forward, and with skill united to her beauty, the well-known fable of 'The Boy and the Frog.' From that period Miss Kemble continued to perform regularly in her father's company till she attained her fifteenth year; and, at the early age of thirteen, she sustained the principal female parts in several standard English operas. Having formed an attachment to a young actor named Siddons, which was not agreeable to the family, Miss Kemble was removed from the theatre, and placed under the tuition of the gentleman of Guy's Cliff, Warwickshire, in the capacity of reader and companion. At the age of eighteen the affection of the young couple being unmindful of separation, Mr. and Mrs. Kemble consented to their union. They were married at Trinity Church, Coventry, November 26, 1773, and the young bride returned to the provincial stage at Cheltenham in company with her husband. 'It was a happiness,' remarks Mr. Bosden, in his Life of Mrs. Siddons, 'to see a pair of actors whose mariners to have been born in the exact position of life, and at the precise time she was. Somewhat earlier, her correct feeling might have kept her from the stage, though the true sphere of talent was certainly open to her.' She returned to the management of the theatre when the profession did not disgrace a woman of virtue. Becoming early attached to a man of the most honoured and steady character, the income offered to her beauty did not disturb her peace or impair her talents. She was one of the few smooth and elegant women of the hon. Miss Boyle, Lord Bruce, afterwards created Earl of Aylesbury, and some other noble personages. Upon their strong recommendation, Garrick was induced to send King down to Cheltenham, to witness her performance. In the Fair Pennitent.' The Rev. Henry Bates, afterwards Sir Henry Bate Dudley, was also much struck by her Rosalind; and her transfer to the metropolis being at length determined on, she made her first appearance in 1791, at Drury Lane, on Friday, December 29, 1775, being then only twenty years of age, in the character of Portia, in the 'Merchant of Venice.' Garrick performed Shylock. She was an incomparable lady and an incomparable actress. She received, failed to make any strong impression, being thought more of as a beautiful young woman than as a great or even promising actress. On the revival of 'Richard the Third,' Garrick not having acted Gloucester for five years, he cast Mrs. Siddons the part of Lady Anne. She there, says Mr. Bough, 'met Roscius in all his terrors,' and on the first night hung a little back from timidity. 'I have mentioned,' he continued, 'in another work the glance of reproach that corrected the failure, and the extreme sensibility with which it was long retained.' The fact was, as Mr. Campbell states it, that instead of advancing to the front of the stage to the gaze of the audience, she by 'hanging a little back,' compelled him to act the scene with his back towards the audience, instead of her, an unintentional annoyance which he never forgave her, or at the close of the play, when the remembrances of next campaign were under consideration, his answer to the person who mentioned in her turn 'the young lady,' was simply 'Let her go.' For this latter circumstance we have the authority of a still living contemporary of Garrick and most intimate friend of Mrs. Siddons, whose memory is as clear and retentive as his means of information were numerous and peculiar. But the triumph of Mrs. Siddons, though retarded, was not to be prevented even by so great a theatrical catastrophe as her premature death. In the spring of 1793 Garrick, after a residence at Birmingham, where her genius was acknowledged by the celebrated actor, Henderson, whom he pronounced her to be the first and best of actresses; to have in herself all that her predecessors possessed and all they wanted,' and predicted that 'she would never be surpassed.' From Birmingham she went to Manchester, York, and Bath, increasing her reputation to such a degree that offers were again made to her from the metropolis, and on the 10th of May, 1795, she re-appeared at Drury-lane, as Isabella, in the Fatal Marriage.' On the 30th of October, she performed Euphrasia in 'The Grecian Daughter,' and subsequently enacted Jane Shore. Colissa in the Fair Penitent, and Phoebe in 'Venice Preserved,' a succession of triumphs which established her fame; and at the end of the season she went to Dublin, where her brother John was engaged for three years. In 1789 the celebrated trial of skill took place between the rival
Lady Randolphs, Mrs. Crawford, at Covent Garden, and Mrs. Siddons, at Drury Lane, and added another leaf to the laurels of the latter. In 1784 a cabal was made against her, upon a most unfounded charge of illiberalit...the season she was reduced to devises the scenes and revive the recollections of her former glories; she performed on the 23rd of May for the Covent Garden Theatrical Fund; on the 12th of July for Mr. Charles Kemble's benefit, and the 22nd of the same month at Drury Lane for the fund of that theatre. In November, 1815, she acted for ten nights at Edinburgh for the benefit of the widow and family of her son Horace, who had died at Covent Garden, 80 times in 1815, in charities and charities, and at the request of the Princess Charlotte of Wales, who was, however, unfortunately prevented by illness from witnessing the performance. In 1817 she performed (June 5) for Mrs. Kemble's benefit, and made positively her last appearance upon any stage at Covent Garden, June 9, 1818, for the benefit of Mr. and Mrs. Charles Kemble, in the character of Lady Randolph. For a time after her public father, and in 1812, and Siddons gave occasional readings alternately from Shakespear and Milton at the Argyle Rooms, having been led to do so in the first instance by the kind desire of serving the widow of Mr. Cherry, author of 'The Soldier's Daughter.' She was also honoured by a command to read to Queen Charlotte and the Royal family at Frogmore, and an invitation from the Universities of Oxford and Cambridge. 'Whether this great actress regretted the stated calls to exertion,' says Mr. Bouden, 'I know not.' That she did regret them how there can be little doubt, from the following remarks, which one day made to an old and attached friend, an eminent actor: 'What a life! I am still living from work. I often think it was about the period of the evening when she had been accustomed to repair to the theatre to dress for the performance. 'At this time,' she observed, 'every body in London was talking of me! I was the only person thinking of me!' The tone in which this was spoken, and the sigh which accompanied it, sufficiently indicated the feeling with which she contrasted her public and private life, although still the queen of every circle she surrendered to enter. She died on the 8th of June 1831, about nine in the morning, at her residence in Upper Baker Street, in the 76th year of her age, and the prophecy of Henderson has not yet been falsified. 'The talents of this great woman,' remarks one of her biographers, 'are said to have been slowly developed and the growing claims of her family seemed to be the only unrestrained calls upon her genius. At length fully kindled, it burst forth with a brilliancy that in her own sex has never been witnessed, and rumbled in its charm the spell of the great enchanter Garrick in all but his universality.' Mrs. Siddons lost her second daughter, Maria, in 1793; her husband in 1802; her eldest daughter, Sarah, in 1803; and her son, Henry, in 1815; a third daughter, Cecilia, and her son George survived her. Amongst the most celebrated portraits of this unrivalled actress are a full-length in the character of Isabella holding her hand, which has been engraved; another, in the character of the tragic muse, by Sir Joshua Reynolds, painted in 1784, and now in the collection of the Marquis of Westminster; a third, reading 'Paradise Lost,' by W. H. Holl; and, in 1833, four by Harlowes, who also painted her as Queen Katharine in the well-known picture of the trial scene from 'Henry VIII.' executed for Mr. Thomas Welsh; and shortly before her death she sat to the late H. P. Briggs, Esq., R.A., whose interesting portrait of her (a three-quarter length) was exhibited at Somerset House, but has not been engraved.
alliance between that nobleman and the Earl of Chatham, whom Addington had been in the habit of visiting in his professional capacity. The negotiation, which of course came to nothing, appears to have originated solely with the two physicians—who afterwards quarrelled upon the subject and assassinated each other—a mere mixture of calumny and recriminations—and to have been carried on for the greater part without the knowledge of the two noble persons who were principally concerned. Lord Chatham was at the time on his deathbed.

Meanwhile Addington's son Henry, after having commenced his classical education at Winchester School, had been entered at Brasenose College, Oxford, in January, 1788, and in 1789, and in 1798 obtained the Bachelor's Prize for an English essay. On leaving the university he entered himself a student of Lincoln's Inn, and was called to the bar on the 11th of May, 1784.

Events, however, had by this time taken a course which had the effect of withdrawing him from the further pursuit of the profession upon which he had thus entered. His father's connection with the family of Lord Chatham had led to an intimacy while they were yet boys between him and the younger William Pitt, who was his junior by about three years, but had been in parliament since 1780, and was already, with his father and the macheinon in the administration of the post of first minister of the crown. Addington is said to have been previously fond of attending the debates in the House of Commons; his brother-in-law, James Sutton, Esq., of New Park, had sat with him. On Mr. Pitt's suggestion he stood for and succeeded in getting himself returned for that borough at the general election which preceded the opening of the new parliament on the 18th of May, 1784.

The long political career upon which he now entered was not marked by many events in which he bore a prominent part, and its general course may be briefly traced. So long as he was only a member of the House of Commons—in which he retained his seat for Devizes until he became a peer—he was, as might be expected, one of Mr. Pitt's steadiest supporters. Accordingly, when the office of Speaker became vacant in May, 1790, by the promotion of Mr. (afterwards Lord) Grenville to be secretary of state, Addington, although so comparatively young a member, was put forward as the ministerial candidate, and was elected by a large majority. He filled the chair, with considerable credit if not with any remarkable distinction, till on the retirement of Pitt, in March, 1801, he was induced to undertake the formation and chiefship of a new ministry, with the offices of chancellor of the exchequer and secretary of war. The government thus succeeded rapidly, and with great success, as the journals of the time have recorded. The principal events which now occurred were his accession to the principal posts of the realm, and the transactions of the year 1802, and views had by this time considerably diverged. Addington had come to be considered as the head or leader of the class of persons specially styled the King's Friends; and it was said that he had been at the express request of his majesty that he now assumed office.

The most memorable event of Mr. Addington's short administration was the Peace of Amiens, which proved still shorter than its author's tenure of power. Soon after the renewal of the war in the beginning of 1803, Pitt, who had hitherto supported his old friend, began to intimate an apprehension that he was scarcely equal to the crisis, and then openly joined Fox and opposed the opposition. The result was that Addington resigned, and Pitt was restored to power in May of the following year.

The displaced minister however made no attempt to form a party against his successor. He would probably indeed have admitted as readily as any one else that Mr. Pitt was the preferable person of the two to be at the head of affairs at such a moment, now that he was willing to accept the post under the condition—namely, the abandonment of the question of Catholic Emancipation—which he had formerly rejected, but which the king, and, it must be added, the great majority of the country and both houses of parliament, regarded as indispensable. The resignation of office by Pitt in May, 1804, was a concession on his part of a great point and a great principle, and a decided victory obtained by George III. and his friend Addington. The new government was from the first supported by Addington's adherents, and had the appearance of having a majority. He took office as president of the council, being at the same time made a peer by the title of Viscount Sidmouth. It is said that he accepted this elevation, which removed him from the House of Commons, with much reluctance.

The writer (probably a near relative) of an extended and elaborate memoir of Lord Sidmouth, in the 'Gentleman's Magazine' for April, 1844, has given a full and clear account of every other event of any importance in his lordship's career, merely informing us, without a word of explanation, that he resigned the presidency of the council in July of the same year in which he accepted that office. The causes are thus stated in the 'Annual Register,' in the relation of the proceedings, so distressing to Pitt, which were this year taken against Lord Melville:—"During the whole of these proceedings the new president of the council, Lord Addington, was not present; nor was the minister, and took an eager and an active part in bringing Lord Melville to the bar of public justice: conduct which must have been considered as a defection from the government of which they formed a part, and, as such, must have been deeply resented by the minister. It was also rumoured that other causes of distaste and disagreement existed between Mr. Pitt and Lord Sidmouth at this period: that the former was jealous of the influence which the latter administered in a certain quarter, which had lately been manifested in the conferring of high ecclesiastical dignities; and that, instead of gaining an useful ally, Mr. Pitt had only exposed himself to the additional annoyance of seeing the cardinal's reports were founded in truth it is not our province to decide; but certain it is that on the 10th day of July the Viscount Sidmouth and the Earl of Buckinghamshire resigned their respective offices.

When Mr. Fox and Lord Grenville succeeded to power in February, 1806, after the death of Pitt, Lord Sidmouth was made lord privy seal; and when the ministry was re-constituted in October, he was replaced in his former post of president of the council, which he held till the breaking up of Lord Grenville's government in March following. After this he remained out of office for about five years. Then, in April, 1812, in the last moment before the formation of Mr. Addington's government, he was appointed president of the council for the third time.

In June of the same year, when Lord Liverpool assumed the premiership after the assassination of Mr. Perceval, Lord Sidmouth became secretary of state for the home department. This office, which for the first time gave him much of a real share in the business of government, he continued to hold for the next ten years. He conducted on several occasions, as, for instance, on that of the great meeting for reform, held at Manchester in August, 1815, exposed him to a good deal of popular outcry and obloquy; but he was never charged with being deficient in decision and fearlessness, and he at length obtained the acquiescence of the ministers in the national defence of the country from the privy council was often seriously endangered. He resigned his office in 1822; but at the earnest request of Lord Liverpool he retained his seat in the cabinet for two years longer. He finally retired from official life in 1824; and continued for some years to attend frequently in the House of Lords, though he seldom spoke. He had at no time, indeed, been accustomed to come forward much in debate. He survived till the 1842, and died at his residence, the White Lodge, in Richmond Park, of which he was deputy ranger. Lord Sidmouth was twice married; first in 1791, to Ursula Mary, daughter of Leonard Haunmond, of Chees, in the county of Surrey, Esq., who died in 1811, after bringing his four sons and four daughters; secondly, in 1823, to the honourable Marianne, widow of Thomas Townshend, of Honington Park, in the county of Warwick, Esq., and only daughter of Lord Stowell, who died before him in 1842.

('Gentleman's Magazine,' for April, 1844.)
ment in the year following, and his successor William V. suspended the college altogether. Johann von Siegen retired to Juliers and afterwards to Kampen in Holland, where he died in 1652.

It is known of the life of Ludwig von Siegen from the time that he left the College of Casel 1626 until 1637, except that he was in France and Holland, and it is probable that he was doing military service in this time. In 1637 after the death of the Landgrave of Hesse, he was appointed page to the young prince William VI., by his mother the regent Amelia Elizabeth of Hanau, and in two years afterwards he received the title of Kammerjunker, and served in that capacity until 1641. It was during these years, between 1637 and 1641, that Siegen discovered his new method of engraving, but he removed in 1641, or in the beginning of 1642, to Amsterdam, without imparting his secret in Germany. On the 19th of August, 1642 he sent a letter from Amster-
dam to the Landgrave, enclosing some proofs of a portrait of his mother Amelia Elizabeth, and the plate of these prints is the first mezzotinto engraving. Siegen speaks of his portrait in the letter referred to as executed in a new and astonishing manner, invented by him; and he further observes, that no engraver will be able to devise the manner in which it was executed. This letter still exists among the archives in the Library of the Count of Casel. 3 lines from "L'Historic de la Gravure et Maniere Noire," (History of Mez-
zo-into Engraving).

This earliest mezzotinto engraving, though as the above letter testifies, it was executed in 1642, was not published until 1648, when it appeared with the date altered to that year, together with a portrait of Elizabeth of Hungary; and the prints drawn off by Siegen himself, not already disposed of, were all on the same date, and a number of all three exist still. The inscription of the original print was as fol-
lowing:

"Amelia Elisabetha, D. G. Hassiae Landgravia, &c.
Comitata Hac vinum ad se primum depictum
novum, jam sculptura modo expressum, dedicat concors.
L. a S. Ao Dom. 1642." It is a bust portrait, 16 French inches high by 12 wide, and is rounded at the top.

After the termination of the Thirty Years War in 1648, Siegen left Holland and entered the military service of the duke of Wolfenbuttel, and he married shortly afterwards the daughter of Michael Call, the bishop of Hildesheim, by whom he had several children. In 1654 he returned to Holland, and visited also Cologne, where he resinned the style of Siegen von Sechtem, from the name of his paternal estate, to part of which he also was become entitled. From Cologne went he to Brussels, and there he became acquainted with Prince Rupert, to whom he communicated his new method of engraving. Prince Rupert, to whom the portrait painter Walleran Vaillant, who assisted him in his attempts, and engraved several plates in the style at Brussels and at Frankfort, in 1656 and 1658; a few good prints were also executed by Prince Rupert himself. The secret is, however, said to have been sold by one of Siegen's sons already in the year 1656, and was known at that time at Mainz. This general publication of his discovery, forced Siegen to sign himself, on one or two of his plates at this period, as the in-
venter of this new method of engraving.

It was, however, in England that Mezzotinto engraving was first cultivated to any very great extent or with very great success. In 1650, Prince Rupert accompanied Charles II. to England, and explained the whole process of the new art to his friend Evelyn, who was then engaged on his history of engraving; and in this book, which was published in 1662, he describes it as Prince Rupert's, and published a specimen of the style by the prince. Through this work, entitled 'Sculp-
tura, or the history and art of Chalcography, and engraving in copper,' with an ample enumeration of the most renowned masters, which is annexed to the book, was a new method of engraving or mezzo tinto, communicated by his Highness Prince Rupert to the author of this treatise," Prince Rupert was generally considered the inventor of mezzotinto. Evelyn persuade he was the original inventor of the art, yet from a paper which he himself drew up on the subject, to be read before the Royal Society as a

communication from the prince himself, the invention is not claimed by the prince, and this paper is noticed by Evelyn in his history, in preparation: it was written, but was never read before the Royal Society. In his history, Evelyn heads the following passage thus: "The invention, or new manner of engraving, or Mezzotinto, invented and communicated by his Highness Prince Rupert Count Palantine of Hesse, &c.,' In the paper prepared for the Royal Society, the following passage occurs: "This invention, or new manner of en-
graving, was the result of chance, and improved by a German soldier, who, copying some scarpe of barrel of his musquet, and being of an ingenious spirit, refuted upon it, till it produced effects, which indeed show the delicacy therefore much superior to any invention extant of this art, for the imitation of those masterly drawings, and as the Italians call it that morbidize expressed in the best of their designs. I have had the honour to be the first of the English to whom it has been yet communicated, and by a special indulgence of his Highness, who with his own hands was pleased to direct me with permission to publish into the world, but I have esteemed it a thing so curious, that I thought it would be to profane it, before I had first offered it to this illustrious society.'

Sundrari was better informed as to the origin of this art. 'Though it was done for the first time in England, it is attributed to Siegen, under the title of Siegen: he says, 'the inventor of this art was a lieutenant-colonel in the Hessian service, of the name of von Siegen, who discovered it after the peace in 1648.'

Siegen was born in 1616, as the date of his death is not known; he was still living in 1676, when he was commissioned to engrave the portrait of Anna, and he then styled himself Ludwig Siegen von Sechtem. He appears to have wholly given up engraving in the latter years of his life.

Laube gives the following list of Siegen's engravings:—
the portrait already mentioned of the Landgravine of Hesse, marked L. a S. 1642; Eleonora de Gonzague, wife of the Emperor Ferdinand III., sometimes called the Queen of Bohemia, a bust portrait, marked Onthodorth, 1644; a portrait of H. a S. 1645, high, by 16-6 wide, marked L. a Siegen Inventor fecit 1643; Prince William of Nassau, Guilielmus D. G. Princeps ariacus comes Nassauia, &c. also after Onthodorth, marked L. a Siegen Inventor fecit 1644, 1 foot 7 inches 4 lines high, by 1 foot 3 inches wide; broad; and Augusta Maria Caroli M. B. Rex filia Guilielmhi Princ. a. sous, of the same size and date; the Emperor Ferdinand I. III., marked L. a Siegen in Sechtem ex. novoa, se invento modo sculptur Anno Domini 1654, 1 foot 3 inches 7 lines high, 1 foot 1 line wide; St. Bruno,—L. a S. A. 1654, 11 inches high by 6 inches 11 lines wide; and lastly a Holy Family after Anniabal Caratti, also 1654, which is inscribed to Prince Leopold of Austria—Land, a Siegen huiurs-

SIEYES: EMMANUEL JOSEPH, Count, more gene-

rally known as l'Abbe Sieyes, was born at Frejus on the 3rd of May, 1748. Destined from early youth to the ecclesiastical profession, he completed his studies with success at the Uni-

versity of Paris, where his mind became imbued with the phi-

losophical speculations prevalent at that period, and he applied
himself seriously to political economy, and to the investigation
of the various schemes of social reform which were then so fre-
quently suggested. The liberality of his sentiments does not ap-
pear to have impaired his advancement in the Church. By the
patronage of De Lauberee, Bishop of Chartres, he was
appointed to a canony in that Cathedral, and afterwards became Vicar-General and Chancellor of the dio-

ce. He took an active part in several assemblies of the clergy,
and warmly espoused those opinions which were rapidly produ-
ing the Revolution of 1789. When the disordered state of
the public finances compelled the government to summon the
States-General, and the Whig ministry, which was now
was to be convoked? Whether they were to be called upon,

as in the last assembly of 1614, to vote by classes, or, as
justice and the necessities of the time appeared to require, by
individual votes? The latter is the individual vote. It states that Prince Rupert was the original inventor of the art, yet from a paper which he himself drew up on the subject, to be read before the Royal Society as a
him on the highest pinnacle of political popularity. The first was entitled "Essai sur les Privileges: the second and the most remarkable, "Qui est ce que le Tiers Etat?" in which he asserts that the "Tiers Etat" is the nation itself; he then proceeds to show the extent of its influence on the government of France, and he demands for it a political recognition. The title of the third pamphlet was "Moyens d'Exécution des Représentations de France pour- doux intérêt de l'État en considéré des intérêts de la noblesse et de la nation."

On the convocation of the States-General Siewy was elected deputy for Paris. An opportunity for carrying his scheme into effect was afforded by a marked increase in the power of the nobles and clergy to unite with the "tiers état," and to verify their powers in common; by his eloquent exertions he induced the representatives of the people to constitute themselves into an independent body styled the National Assembly (June 18, 1789). He it was likewise who proposed the oath which was taken by all the members at the "Jeu de Paume" (BAILEY, P. C.) to never to separate themselves, but to assemble whenever circumstances required until the perfect establishment of the constitution.

This sudden and vigorous measure, which must have proved the immediate signal of civil war had not the power of the other orders divided; the already paralyzed, was re- homed by Mirebeau (MIREBEAU, P. C.) at the head of the more moderate of the republican party; it was however carried by a very large majority. So great was the popularity of Siewy that, in the National Assembly, he was greeted by the loud and reiterated applause of the members present, who rose up to receive him. On the meeting of the 22nd of June, when the king declared the resolutions of the Assembly to be null and void, he would have proceeded to disperse, Siewy energetically reminded them that they were "still the same body to-day that they had been the day before, and bid them proceed in their deliberations." "They did deliberate," says a writer in the Foreign Quarterly; "the revolution was the result." Siewy was also the framer of the decree which was passed on the 30th of October, by which the ancient provinces were abolished, and France at last divided into departments all governed by the same law. (FRANCH, P. C.)

He continued to take a prominent part in the deliberations of the National Assembly until the publication of those decrees which he considered of too levelling a nature, and which alarmed him as to the ultimate result of the innovations which he had himself been too eager to introduce. Accustomed to command, he was unable to endure contradiction, and, when he found that the measures which he opposed were carried in spite of his influence, he betook himself to a sudden silence from which even the persuasions of his eloquent colleague, Mirebeau, were unable to rouse him. The most important of those measures was a law regulating the fate of the tithe-holders. To this he was favourable; but he considered that they should be purchased by the landed proprietors, and an indemnity for their loss made to the tithe-holders. To this indemnity, however, he was opposed, and a few days afterwards, on the 1st of April, he died of a painful disease.

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He was named member of the new Comité du Salut Public; on the 19th August of the same year he made a proposition to the Convention to establish a constitutional jubilee, which was rejected. During this time he chiefly occupied himself with the direction of the foreign affairs, and successfully carried on several important negotiations with the European states, and went to Holland to conclude a treaty of alliance.

In the same year Siewy was named by the Council of Antients one of the five directors, but he declined the proffered honour, and Carnot was appointed in his stead.

In 1792 he had a narrow escape from the hand of an assassin, l'Abbé Poule, who, entering his room, fired a pistol at him at arm's length, and one of the balls shattered his hand. He behaved on this critical occasion with his usual coolness, and quietly wrote to his friend, M. de la Vallière, that Poule should return, inform him that I am not at home.

In 1798 Siewy was sent on a mission from the French Government to the court of Berlin, in which, though he failed in his attempt to prevent the declaration of war, he succeeded in securing its neutrality. On his return to Paris the following year he was named member of the Directory, a nomination which showed the disposal of the counsels, as he had openly expressed his dissatisfaction with the directorial government. Placing himself at the head of a conspire which had been formed against three of his colleagues, who were known for their republican sentiments, he pro- cured their forced resignation, and a new Directory was formed in which the majority was favourable to his views. Another important measure which he effected through the instrumentality of the Minister of Police, Fouche, was the closing of the Jacobin Club, a body whose name was associated with all the excesses of the Revolution. These measures, as they destroyed the popularity of the author of the Tiers Etat, and exposed him to the enmity of the populace, made him anxious to secure the support of some military leaders, whose talent and energy to take upon himself the sole direction of the affairs of state. We must have no more dealings with declaimers, he said, among them the Military chiefs there were many at that period, some of them of the highest renown, but they appeared to Siewy to fail in the necessary requisites for a civil ruler. Joubert, in whom he had placed great confidence, was killed, and the new minister was merely a brave and skilful soldier, and Anguerru and Bernad- dotte were too well known for their democratic sentiments. The arrival of Bonaparte from Egypt (BONAPARTE, P. C.; KLEBER, P. C.) determined the difficulty; the penetration..."
of Sieyes discovered in him a fit associate for his designs. They were favoured by the enthusiastic reception which Bonaparte met with from all ranks and parties on his arrival, by the views of this military chief himself, and by the active cooperation of many of the French generals and the most influential members of the legislature. The talents and influence of Sieyes were appreciated by Bonaparte, while the speculative nature of his mind was not without its influence on the latter's forming an object of jealousy. Mutual esteem indeed there was none; they were in the frequent habit of expressing their divergent views in unmeasured terms; but to effect his end the soldier felt the power of the philosopher, in conjunction with the statesman, and the statesman perceived that a salutary change could not take place without the strong support of the soldier.

The Revolution of the 18th Brumaire (9th Nov., 1799) was the result of this co-operation, and Napoleon, Sieyes, and Roger Ducos were the first consuls named, and two commissions of twenty-five members each were appointed from each Council of State to assist the consuls in the formation of a new constitution. In the formation of this constitution, however, Sieyes and Bonaparte soon disagreed; Sieyes was allowed to form a legislature according to his political speculations, and he made it consist of a Senate without the power of debate, and a Tribunate which was to discuss with the Council of State the legislative measures proposed. But to this he was opposed by Bonaparte, respecting the Tribunate, which was to be vested in a Grand Elector, whose sole power was to consist in the nomination of two consuls who were to exercise all the powers of government, Bonaparte offered a vigorous and active resistance.

Discontented with the overbearing character of his political theory, and discovering with characteristic penetration that he had found his master, he refused to act a subordinate part in the new constitution, which was proclaimed on the 5th December, 1799. At this period he may be said to have terminated his public career. His services however were richly rewarded with 600,000 francs and the estate of Croze, which was afterwards exchanged for a magnificent hotel in Paris, and the valuable land on the island of St. Nazaire in the park of Versailles. 'Thus the democratic fervour of the author of the pamphlet 'What is the Tiers Etat?' sunk into the interested apathy of the proprietor of fifty thousand pounds.' (Allion.) This writer quotes also from the 'Memoirs of Gohier' an incident characteristic of the extreme capriciousness of Sieyes, to use no severer term (History of Europe, vol. iii, p. 855), but it must be remembered that Gohier was the President of the Directory on the 18th Brumaire, that he was strongly opposed to Sieyes in political opinions, and that he evinced throughout his Memoirs much personal hostility towards him.

Shorn of his consulate and the empire, Sieyes studiously avoided all participation in power. He declined the offer of the presidency of the Senate, and contented himself with accepting the title of Count. Napoleon borrowed largely from his works; and it is said that he had the talent of finding in many of his political ideas the basis of the legislative measures which he introduced. At the Restoration he was exiled, and only returned to France after the Revolution of 1830, fifteen years afterwards. He died at Paris, in tranquil obsequies, on the 20th June, 1836.

The character of Sieyes has been graphically depicted by Dumont [Douxson, F. C.] in his valuable and interesting Memoirs. 'His manner,' he says, 'was neither frank nor engaging; he was a man with whom it was difficult to become intimate, and who was wont to express his opinion without desiring to enter into any discussion upon it. His writings gave him a well established reputation; he was looked upon as the oracle of the Tiers Etat, and the most formidable enemy of privileges. He was easily excited to a display of ill temper, and inclined to hold the existing state of society (1790). I imagined that this friend of liberty had necessarily a liking for the English nation, and the subject being familiar to me, I introduced it to him, but I was not prepared for the surprise that the English constitution was in his eyes a mere piece of charlatantry to impose upon the people: he seemed to pity my ignorance as I described the various modifications that system had undergone, the branches of the legislature, the changes in the executive, the intrigues of the Romanov family, and the support of Louis XVI. He compared this with the opposition a mere court trick ('manège d'antichambre').

The only thing he approved of among the English was trial by jury, which, however, he but little understood, and, in common with most Frenchmen, he had formed wrong notions respecting it. In a word, it was his opinion that the English but as children in the art of framing a constitution, and that he considered himself capable of giving a much better constitution to France.' (Dumont, Souvenirs de Mirabeau, p. 69, 68, Paris, 1842.)

The writings of Sieyes, not already mentioned, are:


SIGNEOGLI, Luca, a celebrated Italian painter, born at Cornosa in 1439, was the son of Egidio di Ventura SIGNORELLI the younger and Vasaari; he was the pupil of Piero della Francesca, with whom he worked at Arezzo, where he lived with his uncle Lazzaro Vasaari.

Vasari mentions many of Luca's works, few of which however still exist; but the altar-piece of St. Onofrio, painted in 1484, is still in the cathedral of Perugia, and there are two other pictures in the cathedral of Volterra; there are also still some pictures by him at Orvieto, Rome, Cortona, at Siena, and in its neighbourhood, and in the Florentine gallery of the Medici, to which he has been, and is still, a great ornament. His most celebrated work is the fresco of the Last Judgment in a chapel of the church of the Madonna or cathedral at Orvieto. The painting of this chapel of the Madonna di Montecito, of which he commenced in 1494, and finished in 1500, is the fresco of Luca SIGNORELLI, who however painted only part of the ceiling, and it was completed many years afterwards by Luca SIGNORELLI. The contract containing the continuation of these frescoes by SIGNORELLI was made by the Prior of the Church of St. Nicholas in 1499. The completion of the ceiling for 200 ducats, and the walls for 600 ducats, besides free lodging, and two measures of wine and two quarters of bread every month. The ceiling was finished in 1500; when the works were finished, it is not known whether the ceiling was done actually within the first year, and this may from the amount of the remuneration be fairly estimated at about one quarter of the whole, the chapel was probably completed in 1508 at latest. The frescoes comprise the history of Antichrist, the Resurrection of the Dead, Hell, Paradise; and such is the vigour and boldness displayed in these works, especially in the invention and the naked figure, and the foreshortenings, that Vasaari and many others have pointed to SIGNORELLI as the immediate precursor of Michael Angelo. Vasaari says that Michael Angelo always expressed a high opinion of SIGNORELLI, and observes that all may see that he made use of the inventions of Luca in the Last Judgment in the Sistine Chapel, especially in the forms of the angels and demons, and in the arrangement.

Luca SIGNORELLE was elected to the Academy of St. Luke for the prize of Sixitus IV. in the Sistine Chapel, which was won by Cosimo Roselli. [ROSSELLI, P. C. S.] He retired in his old age to Cortona, where his Italian fame was rivalled by the Roman and Florentine. Cosimo Roselli, for whom Vasari as having been a man of very high character, and he adds that he always lived more like a nobleman than an artist: he died in 1561, aged eighty-two. The frescoes of the cathedral are described in part by Vasari in his 'Storia del Duomo d'Orvieto,' Rome, 1791. The
design, though full of power, is hard, and the colouring wants harmony.

(Vaas, "Vite de' Pitteri," ed. Schole.)

The Indus was once a great river (see Dist. Nat. 26, c 8, ed. Hard.) for an umbelliferous plant), a genus of plants belonging to the natural order Umbelliferae, and the tribe Seseliaceae. The calyx is obsolete; the petals ovate, oblong, entire, or slightly toothed; the sepals an indented lobe, sessile, truncaate, or appended at the base.

S. pratensis, Meadow Pepper Saxifrage, has an angular stem, supra-compound leaves, pinnate leaflets with the segments raised, and a blossom like a poppy, and an spreading spinous point. The receptacle is scaly. The fruit compressed, its terminal area surrounded by a papillose ring. S. pratensis, is the only species. It has a stem from 8 to 6 inches high, with leaves of a very large size, lancelate, lacerate, wavy, and clasping the radical leaves, pinnaed, and usually variegated green and white. The involucral scales closely adpressed below. The florets are purple, with a white tube. This plant is found in waste places in Great Britain.

(Babington, "Manual of British Botany.")

SINDES or SCINDA is that part of Hindostan which extends from the sea to the near place where the river is joined by the Chinah, which brings it to the united waters of the five rivers of the Panjab. It lies between 23° 30' and 28° N. lat., and 76° and 71° E. long. It extends in length from south to north more than 600 miles, and its average width may be 200 miles. This gives an area of 72,000 square miles, or about 14,000 square miles more than England inclusive of Wales, and nearly as much less than the whole area of Great Britain.

On the south and south-west it borders on the Indian Ocean, and its eastern districts are separated from the province of Outech by the Rumm. To the east of it, and chiefly within its bounds, are the Indian Desert, the Desert of the Rajapo States of Marwar and Jesulmure. On the north-east are the territories of the Khan of Bhawulapore, south of those of the Panjub or Seila. The north-western corners of Sind and the Bootees hills and the South Waziristan, are the limits of the boundaries on the Rajapo States of Marwar and Jesulmure. On the west of the territory of the Khan of Bhawulapore, and south of those of the Panjub or Seila. The north-western corners of Sind and the Bootees hills and the South Waziristan, are the limits of the boundaries on the River Indus. Only the river Indus is the river of India. The river Indus is a very large river, and its waters spread over a great extent of country. In those areas of the river however which are not watered by the river Indus, the dams have no opening. The whole volume is thus driven back and spreads over the district above the dam, and the bed of the river below it would remain dry if the water was not carried by the canals over the country did not find by these canals a way to the bed of the river below the dam. These dams are called bunda.

The river begins to rise in April. Early in May the waters begin to point out the necessity of deepening and cleaning out the various canals. Towards the middle of June there is sufficient water for sowing the crops, which are sown in the open and are cut out by the third of September. At the end of September the waters are confined to the bed of the river. A few miles below the point where the Indus is joined by the Chinah, the river enters Sind. About 60 miles lower down, and only about 100 miles above the sea, it begins to divide into arms.

At this place (about 28° N. lat.), the river divides into two branches off on the eastern side, which is called the Eastern Narra. It appears that this arm formerly received a great, if not the greatest, part of the waters brought down, but that the river changed its course more to the west. After this event had taken place, a bund was erected across the Narra, near the coast town of Arour, which is still called the Arour Bund. Thus the Narra was deprived of the annual supply of water, except when the river enters the Indus rose to an unusual height, as in 1831. Its bed would generally be dry, if it did not receive a small supply of water from a remarkable depression, which extends from the vicinity of Bhawulpore to that of Arour, which running water is found during four or five months of the year. This depression, being considerably lower than the head of the Narra, receives large quantities of water from the Narra, and also other small streams, in consequence of which running water is collected in the Narra, but, except under extraordinary circumstances, is seldom in sufficient quantity to reach the sea. The river Narra extends in a south-south-eastern direction to Omerote, skirts the Thurr or Indian Desert. South of that place the river is called Poornam, and receives a supply of water from another river which joins it at that place. About 60 miles above the Narra enters into Poornam, and sends two branches to the Poornam under the name of Goomee. After this succession of water the Poornam has a well-defined channel from 12 to 20 feet deep and from 000

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to 1300 feet wide, but it is obstructed artificially by bunds and naturally by sand-drifts. Further down the channel of the river it is divided by a chain of potholes, salt-water, and partly separated from Sindree Lake by the Alla Bund. The Alla Bund (Embankment of God) is an immense mound, nearly four miles in width and more than fifty in length, which was formed by an earthquake in 1819, the consequence of a convulsion of nature having depressed a large tract of land south of it, which, being filled with salt-water through the Lacoo Creek, now forms an extensive lake. This mound appears to be cut off from the plain by a mound called the Koroee, but in 1826 an extraordinary flood passed down the Narra and Poorumun, and, forcing a narrow passage through the Alla Bund, found its way into the Sindree Lake, and swell up the mouth of the Indus.

About 28 miles south of Buhar the Indus throws off another branch on the right, which is called the Western Narr. It runs about a hundred miles, expands towards the end of its course into the lake of Munchur, and re-joins the river near the town of Sehwan. About seven or eight miles above Hyderabad, at Meanees, occurs the third bifurcation of the river. The eastern branch, called Fulattees, runs southward and receives a considerable supply of water, which however is greatly diminished by the numerous canals which branch off from it. In the lower part of its course it is called Goonree, and sends off two branches to the Poorumun river. It enters not this branch reach the sea except by the last-mentioned river.

The Indus divides again south of Jurrakh, near 25° 27' lat. The eastern smaller branch is called Pinjeees, and below Mugrebee it is called Goonga. It has always water enough to be navigable for flat-bottomed boats, north of the bund at Mugrebee, and even below the dam it is a running stream. It enters the heavens the banks of it are considered as the harbour of the delta, and much frequented. On the bar are fifteen feet of water at high tide, and a depth of four fathoms all the way to Vikkur, even when the tide is out.

The western branch of the Indus is the Buggaur. It leaves the Satar below Tatta, and runs in a general course due west, but with several large bends. About twelve miles from the sea it divides into two branches, of which one runs south-west; it reaches the sea by the Pietaeeen mouth. The other arm runs west-north-west, and disembogues by the Piteeet mouth. Both of these arms divide several times before they reach the sea, and they enter it by several mouths. The two large channels are navigable for sea-boats of fifty tons, but as they are beset at their mouths with sand-banks, which overlap one another, the navigation is intricate and dangerous; still a few boats ascend them to Darajoe.

The Indus, with the exception of the mouths, which, as above mentioned, are accessible for sea-boats, can only be navigated by flat-bottomed vessels which do not draw more than four feet of water when heavily laden. The largest carrying about seven hundred tons, are considered as the largest vessels safe for the river. They are built at the towns along the coast, and the passage of the town of the bed of the river are subject to frequent changes, and large portions of the banks frequently fall down into the water, having been washed away by the current.

Surface and Soil.—The Delta, or that part of Sindie which is enclosed by the Satar and Baghaur branches, has an alluvial soil consisting of successive layers of earth, clay, and sand. As the greater part of the river is cut off from the sea, and the current, on account of the abundance of green forage, which furnishes pasture for large herds of buffaloes. At the back of it extends a belt ten miles in width, where the country is so thickly covered with brush and bushes, even as far as the Poormun. The rice land which lies at the back of the sugar-cane, which yields a coarse kind of sugar. The soil in many parts is impregnated with saltpetre, which is extracted, but not exported, as formerly. The climate is sultry and oppressive in the summer, and in the winter it is cold, but the wind is a gale. If we except a few small towns and villages, the inhabitants reside in temporary villages, which they remove according as they are compelled by the increase of the inundation of the Indus and its tributaries.

That extensive tract of country which lies west of the Indus, and extends from the sea-shore to the town of Sehwan (20° 27' N. lat.) has a different character. It is only along the banks of the river that there is a low alluvial tract, a few miles wide, which can be cultivated, as it has the advantage of being irrigated by short cuts from the river. Beyond its limits the country rises higher, and the soil is gravely and intermixed with pebbles, and soon passes into low hills composed of sandstone. Their height seldom exceeds two hundred feet; but in approaching the Hula Mountains they rise much higher, and form several short ranges, of which the Narra branch of the Indus flows between; the western of these ranges are laid down in our maps. The small rivers which drain this hilly tract have only water for three or four months; but during the remainder of the year abundance of water is found in pools in the beds of the rivers. The soil is clay, and gravel mixed together, but they are not cultivated. In these parts are no fixed villages, the country being inhabited by nomadic tribes, whose wealth consists of camels, sheep, goats, and buffaloes; the Hula Mountains, which lie between this tract and Beloochistan, are barren and almost without vegetation.

Proceeding on the same side of the Indus, north of the town of Sehwan, we enter one of the most fertile districts of Sind, which extends some miles north of Shikarpore. The country is level, and the means of irrigating the land are abundant; for besides the main channel of the Indus, which is used for irrigating the adjacent lands, the interior of this region, for the greatest part of its extent, is traversed by the Western Narr, which parlates the inundations of the principal river, and at some places connected with if by transverse canals. The lake of Munchur extends about eighteen miles from north-north-west to south-south-east, and is about eight or nine miles across. In the dry season its waters are brackish, in the rainy season they are dry, and yield very rich crops. That part of the plain which lies north of the place where the Narra branches off from the Indus, derives the same advantages from the deep water which is high in the rainy season, and extends fifty miles inland, until it joins the Narr, after passing near Shikarpore. The principal articles of cultivation in this plain are cotton, sugar, and rice. Large droves of buffaloes, cows, Excellent sheep, and goats, are pasturing on the country. Various kinds of trees of great size are found in many places, and yield plenty of timber for the construction of water-wheels and for other agricultural purposes. The river, as well as the lake, is navigated by boats.

The plain properly extends farther northward to the boundary-line of Sind; but north of Shikarpore it attains a higher level, and as there are no canals, irrigation is not practised. As however the soil is very good, which is shown by the excellent pastures and large trees, this tract would also yield abundant crops if it was well protected against the predatory tribes which inhabit the adjacent Murrrees and Beloochistan. But these tribes have the last in subjugation of the cultural population and taken possession of the country, in which they wander about with their herds of buffaloes, sheep, and goats.

The country on the east of the Indus, from the northern boundary-line to the parallel of Hyderabad and Omercorse, presents a different aspect. The banks of the river to the distance of two or three miles inland are covered with tamarisk and salt-thorn; the soil is sandy and waternod, and is cut by canals, which carry the water of the river to the back country. On the edge of this back country the villages are built, and generally raised somewhat above the ordinary level, to avoid the inundation of the meadows. To these villages are carried by numerous canals. They are generally cut in those...
parts of the river which run east and west, that the water may be thrown south into the interior. Some of these canals are of great extent. One of them, called the Meerwah, conducts by a southerly course the waters of the Indus from the north coast of Sindh to the southern region, where they are lost in sands or dispersed over the fields. The soil of this tract is alluvial, with the exception of a small rocky district which crosses the Indus at Bahbur, and extends on the western side of the Ganges. The soil of all the canals is fringed with a broad agricultural band, on which numerous large villages are built, many of which contain 500 houses. Besides the canals there is a canalast river that meanders northward by which the produce of the soil is carried. In the fair season, when dry, they become the beaten footpath of the people and are excellent cart-roads. Beyond the reach of the water, the cultivated tracts are hard and sandy. Dry and cracked from the heat of the sun, the loosened sand is raised by the prevailing westerly winds into little hillocks from twenty to thirty feet high, which gradually assume the appearance of a desert running imperceptibly to the Thurr. Only at a few places grass is cultivated, as its growth depends on rain, which is very uncertain in these parts of Sind. The lower parts of the uncultivated ground are generally overrun with tamarisk jungle.

The country south of a line drawn from Hyderabad to Quetta, where the Hindu and the Arab tribes of the southern region of the Indus, generally resembles the region just noticed. In its most northern corner, where the Indus and its Fullaloe branch run nearly parallel, is a low ridge of rocks which extends for several miles. In its eastern end, several isolated hills of limestone, of moderate elevation. Except these hills the country is flat and well cultivated in the vicinity of the numerous canals, which bring to the interior the waters of the Sathe and Empigen stream. Between the Indus and Jhang is a tract of wilder country, where the Poroom a considerable extent of country is covered by a salt-marsh. The country near the last-mentioned branch of the Indus is little cultivated, except in the vicinity of the Goomee river. Towards the east, its course is a complete desert, resembling the Rumm. There are hardly any plants met with, except a saltine plant called darre, which forms the principal food of the camels in this uninhabited country. The soil is of such a description as not to absorb water, which therefore remains upon the level surface until it is carried off by evaporation. Indifferent water may be obtained in many parts of this desert by digging wells to the depth of eighteen feet. This sterile tract extends twenty miles from the sea and the Koorai mouth of the Indus to the north-eastern part of the peninsula of Gujarath, a distance of about 200 miles; in breadth it is about 85, but there are various belts and ramifications, by the addition of which its area is increased to 7000 square miles. It is a perfectly level tract, on which no fresh water exists, and not even the most stunted vegetable. The soil is a mixture of mud, sand, and clay, and is covered with a thick incrustation of salt in the dry season, and during the south-eastern monsoon. This, with the effect of working on the common level of the sea, it is lower than the adjacent country. The southern banks are in many places very fertile, but often sandy, and only partially cultivated. On these water of excellent quality is found within a few yards, and tanks of rain-water, within 200 yards from the Rumm itself, retain their sweetness for many months. There are also some islands in the sea for which occurs, but it is scarce. By some the Rumm has been called a marsh, but it has none of its characteristic: it is not covered or saturated with water, but at certain periods it has neither weeds nor grass in its bed, which, instead of being aluny, is hard, dry, and sandy, and of such a consistncy as never to become clayey; nor is it otherwise fenny or swampy. That singular phenomenon called mirage nowhere produces such delusions as in this tract; the smallest shrub at a distance assumes the appearance of a forest.

Climate.—The climate of Sind differs greatly from that of other parts of Hindustan. Though the south-west monsoon from the Arabian Sea begins to blow in April, and the heavy rains from the Himalayas begin to fall in June, the latter do not commence to rain the Indus till the end of June or the middle of July. There are also heavy falls at the vernal equinox. The delta frequently suffers from dearth, and sometimes for several years together, but the dews are heavy.

In Upper Sind (Kohistan), that is, north of Hyderabad, the natives of the country divide the year into three seasons, the spring, the hot season, and the cold season. The spring is of very short duration. The cold of the winter continues to the end of February, whilst the heat which commences in the middle of March is so intense, that it is but little exceeded by that of the following months. The temperate weather therefore between the extremes of the cold and hot seasons is very short. The hot season, which may be considered as the heat of the middle of March, and it continues generally without intermission till the end of August or the middle of September. The storms of thunder attended by rain which occasionally occur in June or July afford a brief respite from the heat. A curious phenomenon is observed in this country on the setting in of one of these storms, it being always preceded for two or three days by a close atmosphere loaded with a fine description of subterraneous atmosphere, which produces a thick fog. But immediately previous to the bursting of a storm the air is literally darkened by immense volumes of sand driven in black masses before the wind, and obscuring the whole surface of the country. These sand-storms, which bear a great resemblance to the pampberos of Buenos Ayres, appear to be the natural effects of the desert countries surrounding Upper Sindo, over which no violent wind can pass without raising clouds of the shifting sands which cover their surface. The heat of Upper Sindo from the middle of April to the end of July is said to exceed that of any part of India, and the thermometer rises sometimes to 120° in the shade. The hot southerly winds which then prevail bring a greenness and a freshness even to the most barren tracts of the land, and the sand-storms, which rise from the sandbeds of the Indus, present a most arid appearance, which is only relieved by the appearance of the river lying much of the country on each bank under water. In September and October, when it leaves the country, the water quickly dries up, and leaves a dry and cracked soil, except in those tracts which have been cultivated.

During the cold season, from October until the end of February, the climate of Upper Sindo is pleasant and salubrious. Frost occasionally occurs, but the first snow which appears in the mountains generally assumes the appearance of winter in the northern climates. The setting of the cold and violent northern winds of November stops all vegetation except a few stunted...
tamarisk and babool bushes. Frost and blighting dew follow, and tend also to destroy a great portion of what otherwise would have been germs of vegetable life, which, if they chance to escape, rise only to be annihilated by the heats of April and May. The crops of Upper Sind are, therefore, early fail in its effects, not only to the European, but the native constit-
ution, and during certain periods of the year exposure to it is as much as possibly avoided by the people of the country.
At the country is only lately become accessible to Eu-
ropians, we have not yet received any series of meteorological observation extending over a whole year. But we have ob-
servations made at Kureechee on the sea-shore, and at Sukkur in Lower Sind for seven months in 1844, and the result of
them is very interesting.

**Kurecheh.**

<table>
<thead>
<tr>
<th>Month</th>
<th>Average Heat</th>
<th>Average Rain</th>
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<tbody>
<tr>
<td>May</td>
<td>83°</td>
<td>85°</td>
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<tr>
<td>June</td>
<td>88°</td>
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<td>July</td>
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<tr>
<td>August</td>
<td>87°</td>
<td>81°</td>
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</tbody>
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From this table we learn that the climate of Sind is really
ger than in those parts of Hindustan which lie in the
vicinity of the equator. The difference between the tempe-

**Sukkur.**

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<td>81°</td>
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Easter. This difference is to be ascribed to the desert countries by which Sukkur is surrounded. At this time of the year (April) only six months during which the hottest months is three or four degrees more intense than at
noon. This is so entirely to be ascribed to the hot southerly
winds, which invariably continue to blow with considerable force till midnight.

**Productions.**—Sind is rich in productions. Though its
botanical wealth is not great, the agricultural products are nu-
merous; all the grains and pulse common to India are
grown. Rice is the staple in the delta and liminities in the
country between the Western Narra and the Indus, but in the
other parts wheat and jooware (large maize) are most closely cultivated; next to these Holca is spicata and Phascolus mungo.
Barley is grown in some districts; other articles are,
Phascolus maximus, Errum lens, Pariwm italicum, and Cicer arietinum.
Indigo is largely grown in the north-eastern districts, but it is inferior to that of Bengal.
Ox is cultivated near Sirkhapore, and in some other districts.
The sugar-cane is pretty generally cultivated throughout the whole
of the province, but its produce is inferior to that of Northern
Hindustan and the Punjab. Cotton is cultivated everywhere, but the staple of the northern parts is the cotton of guage. Quality is grown in the vicinity of Khypoor. Hemp, cumin-
ners, water melons and musk melons, are extensively culti-

Garden produce gardens, turnips, radishes, onions, and several kinds of pumpkins, the egg-plant, three
kinds of beans, peas, the *Monardia charnna*, oil, and mustard.
The root of the lotus, which covers a great portion of the Lake of Munchar, is eaten. Sesamum, garlic, capsi-
cum, and turmeric abound, and the last is used as a dye.
Among the fruits are the date, mango, pomegranate, apple,
grape, lime, citron, fig, apricot, pistachio, and Keara nuts,
several kinds of wild plum, and the tamaraad, but most of these are of an inferior sort, and much inferior to those of Cabool. About Shikarpore and Bukkur the dates are so plentiful as to constitute the principal food of the lower classes, but they are inferior in size and flavour to the Arabian and Egyptian dates, though superior to those of Northern India.

The tamaris is the most abundant production of the uncultu-
ward, and almost as useful to the inhabitants as the bamboo to the native of India. The flowers form an article of export to Persia and the Punjab under the name of anseer. When dried, pulverized, and infused in water, they yield a red fluid in which cottons are steeped to prepare them for
dye. The wood supplies the inhabitants almost exclusively with the material of their houses, the construction of houses, boats, and agricultural implements. The boughs are used for fences and cattle-sheds, tall lines and to thatch houses, and are placed into baskets and mats for boats. The young shoots form a nutritious food for goats and cattle.

Dromedaries and asses constitute the principal means of conveysance by land. The dromedaries are reared in great
numbers, but they are not equal in strength and size to those of the neighbouring countries. The horses of Sind are small
but hardy, and capable of bearing the greatest fatigue. The
horses and asses are imported from Afghanistan and Persia. Mules are only kept at a few places. Immense herds of buffaloes graze on the banks of the Indus and its arms, and at other places common. Other and hides constitute an
important article of export. Sheep and goats are met with almost everywhere in Upper Sind, and wool is exported from that tract which lies west of the Indus and north of Shikarpoore.

Fowls are plentiful in some places; and tigers, wolves, jackals, wild hogs, porcupines, deer, and hares live in the woods. There is only seen north of Sukkur. Hogs are very numerous, and very destructive to the fields. Among the amphibious animals are the alligator, otter, and badger. Badger and otter skins form an article of export to Afghan-
istan. Snakes, scorpions, and centipedes abound in rocky
situations. Among the birds are a peculiar kind of myrropy, or bee-eater, the black partridge, the grey partridge, the quail, two kinds of woodpecker, the razor-beak, several
kinds of gulls, the pelican, and a species of plover. Geese, ducks, divers, and other water-fowl are plentiful on the banks of the Indus and those of Lake Munchar, as also on the swampy

In the Murree and Boggie hills, a species of the Suliman range, sulphur and alum are found, and form articles of trade.
In the delta and other places the soil is impregnated with salt, and some is collected for home consumption. Not a stone of marble is exported from Sind to Bukkur and Roeere is found in the level parts of the country.

**Population and Inhabitants.**—Sind is a thinly peopled

Sind is divided into three distinct classes, the Sindees, the Beloochoos, and the Hindu. In all the larger
towns Hindus are most numerous, but in the smaller villages and agricultural districts the Sindees and Beloochoos form the
bulk of the population. The Hindus are divided into four classes, the aborigines to 600,000, and the Beloochoos to 300,000. The
first are occupied entirely in trade; and in religion, as well as in
habits, are perfectly distinct from the two latter, who are
Mohammedans, agriculturists, the Beloochoos and the Sindees as servant, yet there are many villages throughout Sind wholly composed of natives, and others which are
termed Belooch villages, from being the sole property of that
nation. The Sindees are the less fixed part of the popu-
lation, being scattered over the whole country, whilst many
thousands lead nomadic lives, moving their villages with the rise and fall of the river Indus; they are also boatmen and fishermen. The Sind dees are divided into those who are

*Digitized by Google*
Divisions and Towns.—Sind is divided by the natives into two parts: Lar, which comprehends the southern portion as far north as Sehwan; and Sirs, which extends over the northern portion of the country, Shah-Bunder, Vikkur, and Kurachoo. Shah-Bunder, built on the Mull mouth of the Indus, is a small place, accessible for sea boats of 25 tons burden; it exports rice. Vikkur, situated on the Haurmooe mouth, 25 miles from the sea, is larger, the river being navigable to that place for more than 35 miles for sea boats of 40 tons burden; it exports the produce of the delta. Kurachoo, on the west, and about 30 miles from the sea, is a barren spot, but on the opposite side, the Pitto, is built at the head of a creek, distant from the sea four miles. A harbour, at its entrance protected by a high headland, affords safe anchorage at all seasons to vessels of 300 tons, from whence large boats can pass close up to the town, which is built on a slightly rising ground and surrounded by a mud wall. The bazaars are extensive, but the streets are narrow and filthy. The inhabitants amount to 14,000, and carry on an extensive trade by sea with India, Arabia, and Persia, and by land with Shikarpore.

Hyderabad or Haidarabad, the present capital and seat of the government, is built not far from the east bank of the Indus, between this river and a large Palwash creek, on a rocky eminence. It has no remarkable buildings, and the population, amounting to nearly 30,000 individuals, live in mud huts. Nearly half-way between Hyderabad and the Haurmooe mouth of the Indus, is the town of Shikarpore. Tatt, a large and populous town, the capital city of Sambus mentioned by Arrian. [Alexander, P. C., p. 301.] It appears that at this time the country was divided among a number of independent sovereigns. Nothing is known of the period from the death of the Mughul emperor Muhammad of Ghizni to the year 1748, when Shah Nadir founded the kingdom of Afghanistan, and was annexed to it, but the government of the country remained in the hands of a Bolochee family, the Kalhors, who before that period had settled there and acquired great authority. Among the other Bolochee tribes settled in the country was that of the Talpoorees. Their chief, Byram Khan, was minister of Mirjan Suruswar Khan, the Kalhor ruler, and was with one of his sons cruelly put to death by him in 1776. His death produced violent disturbances in Sind, owing to the extensive influence which he had with his tribe and the country. In 1781 Bejar, another son of Byram Khan, bore arms against his father and was put to death. Shah Nadir Khan exasperated the Talpoorees, who rose in a body, and having dethroned the tyrant, raised Futtih Ulee, the grandson of Byram and chief of their tribe, to the government. Timur Shah was a brother of the sole survivor of the Bolochee family, was put to death. After that, Sind was tributary, and having dethroned the tyrant, raised Futtih Ulee, the grandson of Byram and chief of their tribe, to the government. Timur Shah was a brother of the sole survivor of the Bolochee family, was put to death. After that, Sind was tributary, and having dethroned the tyrant, raised Futtih Ulee, the grandson of Byram and chief of their tribe, to the government. The Talpoorees divided the country into three unequal parts, and each of the three families of which it consisted received a portion of the country. These sovereigns were called Amers.

When Shah Shoajah had lost the throne of Cabool, these sovereigns considered themselves as quite independent, and when in 1834, when he came to Cabool to recover it, they opposed the march of his army through their territories. But he beat them in a battle fought seven cones from Cabool, and obliged them to pay seven cones of rice to the British. The Talpoorees of Shikarpore. Meanwhile Sir Alexander Burnes had visited Sindo (1831) and a treaty of commerce had been concluded between the Amers and the British government, by which the British was given the right to sell goods to the country and to purchase all the goods of every description manufactured in the principal towns and villages, chiefly for home consumption, and a little is exported to Afghanistan and Persia. Among the silk manufactures the languis, a rich fabric of silk, cotton, and gold, variegated in texture, are the most common. The languis are manufactured in the villages of Ranopee, Giambat, Koornah, and Durns, situated near one another, south of the town of Khypore. They are chiefly of silk with cotton borders, or a few of silk and cotton mixed, and inferior to those of Tatta and Bhowal-

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(In 1841), a spirit of insurrection manifested itself in Sind to among the Beloochee tribes, which however subsided when the British army had again advanced into Afghanistan. As the navigability of the Indus for flat-bottomed steam-boats was now ascertained, the British wished to retain the places in Sind where they were still in their possession, and they attempted to establish a firm and permanent new treaty. The Ameer, finding their inability to resist, were willing to grant the proposed conditions, except one, that is, to permit a track-road to be made along the banks of the Indus, because such a road would destroy their shooting-ground along the river. They had here immense enclosures for the chase of wild animals; these enclosures were called shikargars. It was however soon evident that this was only a pretext for breaking the treaty and taking the narrow track-road along the river, required for a track-path, would have not only diminished the immense extent of their shikargars. The negotiations were scarcely broken off, when an army of 22,000 Beloochees was ready to attack the British, and to expel them from Sind. Sir Charles Napier, who commanded 3000 men, British and native troops, stationed at Bukkur and its vicinity, immediately put them in motion. He found the army of the Ameer near Meeanee, a place near the spot where the Falulee branch leaves the Indus. On the 17th of February, 1843, an obstinate battle was fought at Meeanee, between the British troops and the Beloochies, in which the latter were completely defeated. They lost 5000 men, all with their artillery and military stores. The Ameers, six in number, came to the British camp and surrendered unconditionally. On the 10th of March, the capital of the Ameer was taken, and the possession of the British. The Ameers were removed to Bombay and received liberal allowances. Thus Sind became a portion of the British empire in India. Partial insurrections still continued among some of the Beloochini tribes, but the activity of the governor of Sind, Sir Charles Napier, has put them down, and Sind begins to enjoy that peace and prosperity which the British army has conferred on or secured to other parts of Hindustan.


SINGLETON, HENRY, was born in London, 1766. His father died while he was an infant, and he was brought up by an uncle, William Singleton, a miniature-painter, who gave him a good education. In 1786 he was in Paris, where he also were favourite studies with him. At the age of eighteen he obtained the first silver medal for drawing in the Royal Academy; and in 1788 he obtained the gold medal for the best painting of the 'Ode to the Nightingale.' At the age of twenty-five his 'Ode to Alexander's Feast.' The medal was presented by Sir John Reynolds, the last time but one that he presented at the distribution of the Academy prizes, and he is said on the occasion to have congratulated him 'in terms of mercurial Mockery.' Singleton painted portrait and history. The first remarkable picture which he produced was a large portrait piece of all the Academicians assembled in the Council Chamber; this picture is now in the possession of the Academy; he was however passed over, and he had too much pride ever to make a second attempt. He lived in the early part of his career in Norton Street, but removed in 1794 to the Haymarket, where he remained till his death in 1839.

Singleton was versatile and ready in invention, though his style of drawing was uniform; and both his pictures and his designs were very numerous; he was an eminent miniaturist and publisher. West has been heard to say—"Propose to Singleton a subject, and it will be on canvas in five or six hours." The rapidity of his work is very great, he compiles figures of almost every class; many of them have been engraved, and some on a large scale. Among his best works are Christ entering Jerusalem; Christ healing the Blind; John Baptising; Coriolanus and his Mother and Hannibal shriving earnestly to the Roman; which have all been engraved on a large scale in Mezzotinto: further, the Storming of Seringapatam; the Death of Tipoo Saib; and the Surrender of Tipoo's Sons; of which there are large prints by Schiavonetti and Cordon. In his later years he was almost wholly employed upon a large series of illustrations from Shakkapere, which are his principal works: the series included twenty-two plates, and all the engravings of Shakkapere seem to be taken from the favourite dramatic representations of Shakkapere which in Singleton's time were so abundant. He died on the 15th of September, 1839, and was buried in the vacant grave in the churchyard of St. John's Church about thirty years before. (Art-Union Journal, 1839.)

SI PHON BAROMETER. This instrument, which was invented by M. Gay Lussac, is very briefly indicated under Barometer. P. P. and a description of the tube is given in fig. 14 of that article; but, as this kind of barometer has of late been much employed (several of them, for example, were used by Col. Mudge and Mr. Featherstonaugh in determining the atmospheric pressure along the route of the North America from the Penobscot and St. John's rivers to the Bay of Chaleurs), it may be advantageous to introduce here a short notice of the construction of the instrument.

The tube is hermetically sealed at both extremities, the end a, in the figure above referred to, being closed after the mercury is introduced, and at a perforation is made, which is so small that, while it allows a communication between the air within and without, it does not, the affinity of mercury for glass being inferior to that of the particles of the fluid for one another, permit the mercury to escape. A scale of inches, each of which is divided into twenty equal parts, is placed by the side of the tube; and by means of a groove at b, the tube is subdivided into twenty-five equal parts. In the French Siphon Barometer the scale is divided into millimetres (each of which is subdivided into ten equal parts), and a microscope, each of them is divided into one hundred equal parts. Two indices with verniers are applied to the scale, by one of which (at p) is read on the scale the graduation corresponding to the top of the mercurial column of the tube, and by the other (at q), is read the graduation corresponding to the top of the column in the longer branch. The zero of the scale is either between these indices or below the lowest of them; in the former case the sum and, in the latter, the difference of the readings is the true height of the mercurial column.

The siphon barometer has an advantage over those of a different kind in requiring no correction for capillary attraction, since such action equally affects both extremities p and s of the mercurial column: it is extremely light, and is easily brought to a position proper for the observation, but it requires very careful attention of the sights of the instruments. It is necessary to avoid inventing it suddenly, since the glass is liable to be broken by the weight of the mercury when the latter strikes against the end of the tube.

SIPHON, GAUGE, in Pneumatics, is a tube of glass bent so as to form two branches equal and parallel to one another, and each from 6 to 8 inches in length; the tube is hermetically closed at one end and left open at the other. One of the branches is provided with a mercurial column, and the other, in vertical positions with the closed and open ends upwards, they are, by means of a brass stem terminating in a screw, suffixed generally to the under surface of the table carrying the plate to which the glass is fixed by means of copper.
closed at the lower and open at the upper extremity; and the open end of the cylinder is screwed to the table of the air-pump immediately about the orifice of a brass tube which passes directly under the orifice of the tube which, passing through the pump-plate, opens into the receiver, and the lower end being immersed in a small cistern of mercury; for the air in the receiver and that in the barometer tube having the same depression above the mercury—that is, in proportion as the exhaustion proceeds, the pressure of the external atmosphere on the surface of the mercury in the cistern forces mercury into the tube, so that, if the exhaustion within the receiver could be carried far enough, the column of mercury would stand at the same height in the tube as it stands in the tube of an accurate barometer, and would indicate a perfect vacuum in the receiver. The degree of rarefaction in the receiver is consequently indicated by the number of inches expressing the height of the column of mercury in the tube. The siphon-gauge is also provided with a scale of inches which are decimally subdivided; but, while the pressure of the air in the receiver and in the barometer tube being equal to that of the atmosphere, the deflection of the needle from the weight of the column of mercury in the closed branch, the gauge presents no indications: from the time however that, by continuing the process of exhausting the receiver, the pressure is reduced below that of the atmosphere, the deflection of the needle from the weight of the column of mercury in the other, that column descends in the latter branch and rises in the former; and then the degree of rarefaction in the receiver is indicated by the difference between the height of the columns of mercury in the two branches of the siphon.

The proof of the claim to the air-pump, P.C., and a description of which has been inadvertently omitted; was also intended to include a siphon-gauge or the purpose of determining the degree of rarefaction attained in the receiver of an air-pump. It consists of a small glass vessel nearly similar in form to a pear, or rather to a Florence flask, terminating in a cylindrical stem; the upper or smaller extremity is hermetically sealed, and the lower extremity is open. To the upper extremity of the gauge is affixed a wire which passes through an air-tight orifice at the top of the receiver on the air-pump so as to be capable of sliding up and down, carrying with it the gauge in the interior of the receiver; and under the lower extremity of the gauge is a vessel of mercury.

When the receiver has been exhausted as much as may be thought proper, the gauge is pressed down till its lower or open extremity enters into the mercury in the vessel below; at which time, evidently, the air in the gauge will have the same pressure as that of the atmosphere; but on admitting the air into the receiver, its pressure on the surface of the mercury in the vessel about the bottom of the gauge will force mercury into the latter, when the air, which, in its rarefied state, occupied the whole interior of the gauge, will be brought to the same density as that in the receiver, and consequently as that of the atmosphere, and will occupy only a small space at the upper extremity of the gauge. A graduated scale serves to show the volume of the air in its compressed state; and this, being compared with the known volume of the whole gauge, serves to determine the degree of rarefaction which had been produced by the partial exhaustion of the receiver.

At the time when the siphon-gauge and pear-gauge were invented, it was the custom to place the receiver of the air-pump on a ring of leather soaked in oil and laid on the pump-plate, in order to prevent the atmosphere from entering the receiver during the process of exhaustion; when, on the air within being rarefied, a quantity of elastic vapour extracted from the moisture occupied the receiver; now the barometer and siphon gauge have been substituted in its place, the elastic vapour, diminished by the partial exhaustion; but, in employing the pear-gauge, which, during the process of exhaustion, takes up a portion of the elastic vapour, on re-admitting the air into the jar, the vapour will condense upon the water, and the gauge shows only the quantity of pure air which is left in the receiver after the exhaustion. This discovery was made by the Honourable Mr. Cavendish on wit.

P.C. S., No. 152.

Prolonging some experiments made by Mr. Nairne, a distin
guished optician, in which it was observed that the pear
gauges always indicated much higher degrees of rarefaction
than were given by barometers or by siphon-gauges, the
business of the explanation proposed in order to account
for this discrepancy was soon afterwards proved by Mr. Nairne
by means of experiments made with the different kinds of
gauges, in which the last-named instrument, by causing a
moisture from the interior of the receiver. The pear

gauge was then found to show very nearly the same degrees
of rarefaction as were exhibited by the other gauges.

It may be observed here, that the pear-gauge is the instru
ment by which the force of elastic vapour was discovered.

SIROCCO is the name given to a hot and suffocating wind which appears to originate with the rarefied air in the sandy deserts of Arabia, in the plain of the Nile commences; it extends eastward over Arabia, Persia, and some parts of Hindustan, and it is felt, but with less inconvenience, in Italy and Spain. This wind is probably only one of the modifications of that which, in different coun
tries, is called sanoom, simoom, suban or samieli, khamaen,
and harmattan. [Samikeli, F. C.]

Under Sirocco, F. C. reference is made to the article Wind; but by inadvertence the notice was, in the place referred to, omitted.

SISMONDI, JEAN CHARLES LEONARD SISMONDI, D.E., was the son of a Protestant minister of the canon of Geneva; his father emigrated to an autocratic nation of the origin, which has become extinct by his death. His ancestors, who were attached to the Gibeillian party, were expelled from Fira in the fourteenth century, and took refuge in France, where they remained till the revolution of the eighteenth century, when they settled at Geneva. Sismondi was born at Geneva on the 9th of May, 1773. He was first placed at the College of Geneva, where he acquired a sound knowledge of classical literature.

From the college he was removed to the Auditoire, where he was enabled to pursue a more extended course of study. His education being completed, he was compelled by the change of fortune which befell his family, owing to the events of the French revolution, to enter as clerk in the counting	house of the firm of Eynard and Co. at Lyon. Filial obedi
ence induced him to undertake a duty to which he was un
fitted by his previous habits, and which the highly cultivated
disposition of his mind rendered scarcely supportable. The moral training, however, which he underwent in mastering the difficulties of his new situation, and in the regular discharge of its duties, produced an effect which, in after life, he acknow
ledged to have been eminently beneficial to him. He became so

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there, they determined upon emigrating to the country of their ancestors, and arrived at Florence in October, 1798.

They invested the produce of the estate which they had sold in purchasing a small farm at Valmondo, near Piacenza, a farm which had been selected by the young Siomodi. Here he divided his time between the active superintendence of his farm and the preparation for his history which he had projected during his travels.

'Récherches sur les Consulaires Italiens des Premiers Legers.' These works, though they have not been published, are generally regarded as the groundwork of his subsequent historical works. The first, which he adopted for his history of Italy, has been revised, amplified, and illustrated in the work of M. de Toquereille on the democratic governments of America. In 1801 appeared at Geneva the first published work of Siomodi, an essay written during the last part of his stay in Italy; it was entitled 'Tableau de l' Agriculture Toscane.' To his study of this subject may perhaps be attributed the prominence which, in his writings on political economy, he gives to agriculture. Eminently practical in this detail, this interesting treatise discards even the appearance of theory, and contents itself with portraying in true but lively colours the actual state of the country and the manner of life of its inhabitants. The year previous to the publication of this work Siomodi and his parents had again returned to Geneva, where they lived on the remnant of a once large property, which his father had sacrificed to his confidence in the future of a new Necker in [Napoleon]. He published, in 1808, his essay on political economy, with the title 'De la Richesse Commerciale, ou Principes d'Economie Politique appliquee à la Legislation du Commerce.' This work he had been writing for forty years. In 1810, he published, under the title 'Nouveaux Principes d'Economie Politique,' the views of Adam Smith [Smith, ADAM, P.C.] are almost implicitly followed in this treatise, and, as they happened to coincide with the popular notions on the subject, they brought the writer into repute. The vacant chair of political economy in the university of Wille was soon after offered to him by Count Flättner, who came purposely to Geneva to urge in person his proposal. Though the offer was advantageous in a pecuniary point of view, and the acceptance of it on that account urged upon him by his parents, it was declined by him from his dislike to teaching. It was at this period that Siomodi began to apply himself in earnest to historical investigations, and, by the advice of his mother, a woman of cultivated mind and sound understanding, to devote himself chiefly to the study of history.

His residence at Geneva, though it was enlivened by his enjoying the intimacy of several literary persons, such as Benjamin Constant and Madame De Stael, could not deliver him from the desponding feelings which are so common to the most philosophical of our contemporaries. The suggestion of his recent mother, he was induced, in 1805, to accompany Madame De Stael in a tour through Italy. Sympathy of literary tastes had been his chief interest in life, and these two distinguished writers; the influence of the scenes they visited together in that classical country, and the poetic charm cast upon them by the conversation of the authors of 'Corinna,' [KRAIN, ADOLPHE GABRIEL, P.C.], fixed the determinations of Siomodi to consecrate the past glories of the land of his ancestors in the page of history. The first-fruits of his historical studies appeared in the first two volumes of his 'Républiques Italiennes,' which were published at Zürich, in 1807. His publisher, Gremer, is stated to have dealt hardly with him, and the publication of the subsequent volumes, the last of which appeared in 1816, was transferred to Tresselt and Wirtz. A new and more complete edition, in sixteen volumes, appeared during the years 1825 and 1826, both at Paris and Brussels. In the composition of this his first and most important historical work, Siomodi has been blamed for the want of sufficiency as a source of information, and in his want of sufficient use of the collected materials of the 'Républiques Italiennes,' as a historical record, is chiefly due. The style is pleasing and attractive, but, though a good French scholar, he never hesitates to use an unauthentic source of information, and to make his own construction of the meaning with greater precision. The part of the work, which is generally considered to be most defective, is that which treat of the development of the republican constitutions and the modifications which the French Revolution have introduced into them. His Régolaires, published, in 'Laude's Cabinet Cyclopaedia,' an abridgment, in English, of his 'Républiques
Italiennes; a French edition of this work appeared in Paris in 1832, under the title "Histoire de la Renaissance de la France et de l'Art Italienne." The last and least known of his historical works is entitled "Histoire de la Chute de l'Empire Romain et du Déclin de la Civilisation." This work, which was published at Paris in 1841, and in a second edition in 1844, sold by subscription for 1000 francs. The other writings of Simondi are, 1. "Julie Severa," an historical novel in imitation of Sir Walter Scott, in which he describes the condition of Gaul at the time when Rome was a power. This work was published at Paris in 1816. 2. "Etudes sur les Sciences Sociales," published at Paris in 1836; this work contains a collection of articles which he had previously contributed to various periodicals: 8. "De la Vie Contemporaine," ed. 8vo, Paris, 1827. The above is a brief account of the writings of Simondi; but it would be doing injustice to his memory to omit some of the details of his private life and character which have been recorded by his biographers. Surrounded by a circle of all that was most distinguished in literature, he was conspicuous among them for the amiability of his disposition and the devotedness of his friendship. Though he never reached a state of affluence, he was liberal in contributing to the necessities of the poor, and he is said to have spent considerable sums in the furtherance of causes which had political freedom for their object. Fond of society, he never allowed his inclinations to obstruct his studies. His travels were of great advantage to him in his political opinions, and he was careless of the unpopularity this conduct often entailed upon him.

About the year 1840 he felt the first symptoms of the cruel malady by which he was to be watched, which was cancer in the stomach. A short journey which he made to England appears to have aggravated his disease; but his sufferings, though intense, scarcely interrupted his application to study, and he was almost said to have written with pain in hand. Indeed three days before his death, which occurred on the 25th of June, 1842, he was occupied in correcting the last proof sheets of his "Histoire des Francais." Simondi married, in 1819, Miss Allen, sister to the late Mr. Allen of Cressify, member of parliament for Pembroke shire, and to the second wife of Sir James Mackintosh. [MACKINTOSH, Sir James, P. C.]

The following extract, which we translate from the conclusion of "L'Histoire des Francais," will be found an interesting supplement to this biographical sketch of Simondi: — My life has been divided between the study of political economy and the study of history; and, in this long narration of events, the political economist will ever be discovered conjointly with the historian. I have endeavoured to prevent those lessons being lost which experience has given us on the causes which contribute to the creation of those events, and without which we must have remained a nation of pens in hand. I have always looked upon wealth as a means, not as an end; I have always respected it, whether it really advanced the well-being of all classes, and I trust my readers will be enlightened by my criticism. I have taken in the welfare of the cultivator of the land, in the artisan, and in the poor, who has to earn his bread by the sweat of his brow, that all my sympathies belong to the needy and suffering classes of the community.


SKIN, DISEASES OF. The healthy functions of the skin and its structure have been described under SKIN, P. C. Most of the diseases of the skin have been described in this work under the head of their particular names. In this article we shall supply an arrangement of them, and a description of those which have been omitted. The following arrangement is that adopted by Bayer in his work on diseases of the skin.

Class I. Inflammation of the Skin.


Class II. Cutaneous and Subcutaneous Congestions, and Hemorrhages.

Erysipsis, Vibesus, Pustulosis, Purpura Hemorrhagica, Eczema, Dermatitis.

Class III. NEWBORN DISEASES OF THE SKIN.

Necrosis, Dilatation, Affection of the sensitivity of the skin, without appreciable alteration in the texture of this membrane.

Class IV. ALTERATIONS IN THE COLOUR OF THE SKIN.

Order 1. Alarisation. — Leucophaia, partial, general; Chlorosis.


Class V. MORBID SECRETIONS.

Ephiderosis, Acne, Folliculosis Tumours.

Class VI. DEFECTS OF CONFORMATION AND TEXTURE.

Distortion of the Skin. Cicatrizes, Vegetations, Nervus haemorrhoidalis, Subcutaneous fibres, of the skin, political opinions, and he was careless of the unpopularity which this conduct often entailed upon him.

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Class I. Inflammation of the Skin.


extensive, and the tendency to inflammatory action in the skin so strong as to produce pustules instead of vesicles. Such are the cases of Eczema, those forms of Eczema which are usually described by writers on diseases of the skin.— *E. scabra, E. rubra, E. impetigoinosa.* Eczema is more likely to be confounded with itch than any other disease, from which it may be distinct, and which it resembles in its manifestations on the body. In the oil-tubes, and arises from an obstruction to the perforation of their functions, which produces inflammation. The oil-tubes of the face are very liable to obstruction from the exposure to the atmosphere, and the careless use of them. It is observed tipped with a little black spot, and when pressed they give out a quantity of their oily secretion in the form of a little meagery. They were at one time supposed really to contain a very dangerous poison, but the case is either not the same, or the case with the masses of oil in question, it is now known that a little acrasis takes up its whole in these oil-tubes, and is well known to zoologists under the name of Demodex Follicularum. This little insect may then in some instances be the exciting cause of acne.

In the treatment of acne, regard must be had to the general health. It is frequently connected with a diseased state of the gastro-intestinal mucous system, which requires attention. Where it is connected with general debility from a rapid growth, or with a scrofulous constitution, tonics and alteratives with sea-bathing and regular exercise will be found of service to the patient. In the case of any scrofulous, or other disease, characterized by the simultaneous or successive eruptions of red itching pimples, scattered or disposed in groups over the whole body. In the adult what Strophulus is in the child. (Strophulus, F. C.)

Diseases of the skin are very numerous and prevalent. In the case of the majority which occur they arise from the neglect of some of the conditions necessary for the health of the skin. These conditions in general are, good nutritious diet, freely drinking water, and the use of either warm clothing, especially during changeable and cold weather; constant and regular exercise, so as to keep the skin as an extraneous organ in perfect order; and daily ablution of every part of the body, without which and the occasional use of soap it is vain to expect to be free from many forms of skin disease.

SKY is the name commonly applied to the infinite space which surrounds the earth, and of which the visible portion, above the horizon of a spectator on any part of the earth's surface, appears to have the form of a conical segment less than a hemisphere. (Estromogeous or Objecta, P. C. B.)

The atmosphere is surrounded by air charged with vapours and terrestrial particles; and by the refections which, in consequence, the rays of light experience in passing through the earth; this, as already observed, that at times when the sun is seen set behind a mountain so covered, the blue rays reflected to the spectator from the parts of the atmosphere on each side of the mountain, cause the latter to assume a blue colour, the direct light from the mountain not being strong enough to interfere sensibly with the reflected rays.

When the sun has considerable elevation, the rays of light which reach the earth's atmosphere almost perpendicularly to its surface, undergo scarcely any change of direction; but, with respect to the light from the sun which enters obliquely into the atmosphere, the violet and blue rays, or those which are refracted to have the most of the space to cover, are red rays, are partially arrested in their course, and are reflected in abundance to the earth; they thus, when the atmosphere is nearly free from clouds, give to the parts of the sky which are removed from the apparent place of the sun an azure tint.

The blue colour of the sky about the zenith increases in proportion as the sun is nearer the horizon; the rays then fall with a more oblique kind of trend upon the eye, and, at the same time, the blue rays in the beams of light
which traverse the atmosphere in directions nearly parallel to the horizon are absorbed, so that those only, as the yellow and red, which have greater momentum, arrive at the eye of the spectator; in consequence of this the sky appears on the horizon on the side which is towards the sun, appears to be highly tinted with those colours.

Many of the blue rays, after reflection from the upper parts of the atmosphere, however absorbed in passing down to the earth; and hence it is that the blue tint of the sky is found to increase in intensity as the spectator ascends above the general level of the clouds. He finds it, moreover, that these blue tints increase in intensity, or in balloons at great elevations, the quantity of blue rays which, after reflection in the atmosphere, enter the eye, are very great; and the blueness at length becomes a deep blue; they are then minute, but still apparent; they are so much as much as midday at midnight on the earth, during the absence of the moon. It is hence evident that if they were not for the insensible reflections of the light from the sun or moon, which take place in the atmosphere, total darkness would prevail from the instant of sun-set to that of sun-rise; and even during the day, darkness would ensue, so that the stars would become visible, every time that the sun is obscured by clouds.

That the blue tint of the sky is caused by light reflected in the atmosphere is abundantly evident from the fact that the light of the sky is found to be polarised: this quality in light, being of a nature to affect only the plane of vibration of that light which first made the observation, has moreover ascertained that the light of the sky consists of two parts, one blue and the other nearly without colour; and he discovered that these have been ascribed to the refraction and reflections. (Treatise on New Philosophical Instruments, p. 349.)

The hypothesis that the azure colour of the sky is caused by reflections of blue rays, was at one time objected to on the ground that the shadows of coherent objects, placed on white paper and exposed to the sun’s light, should always appear to be blue, since the part of the paper which is in shadow can only be visible by the light of the sky reflected from thence. This phenomenon is, in fact, frequently observed; but M. de Saussure, who first made the observation, has moreover ascertained that the light of the sky consists of two parts, one blue and the other nearly without colour; and he discovered that these have been ascribed to the refraction and reflections. (Treatise on New Philosophical Instruments, p. 349.)

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Smith while in Edinburgh officiated at the Episcopal chapel there. In 1808 he removed to London, where he married the daughter of Mr. Pyle, the banker, and took up his residence. He became popular as a preacher at the chapel of the Foundling Hospital, and at other places. He also delivered lectures on polite literature with much applause at the Royal Institution, in Albemarle Street, and was a regular contributor to the Edinburgh Review.

Lord Erkine, when Lord Chancellor, gave him, in 1806, the rectory of Foston, in Yorkshire. In 1810 he was presented to the living of Alton in Hampshire, which was, in 1813, he was appointed by Earl Grey one of the canons resi'dentary of St. Paul's Cathedral. Except a few years when he resided at his rectory of Foston, singularly, while at which he exerted himself, in 1808. 'Letters on the Subject of the Catholicity to my Brother Abraham who lives in the Country, by Peter Pymble,' his place of residence was London, where he was associated with literary men and politicians of Whig principles, distinguished for his conversational powers, and consequently a frequent 'diner out.' It is probable however that he kept within reasonable bounds of temperance, for he lived till the age of 77. He died at his house in Green Street, Mayfair, London, Feb. 21, 1846, and was buried in the Kensal Green Cemetery. He left the bulk of his property, which was large, to his widow and his son Wyndham Smith.

The Rev. Sydney Smith published 'Six Sermons,' Edinb., 12mo., 1800; 'Six Sermons,' 2 vols. 8vo., Lond., 1809; several occasional sermons and political pamphlets; and contributions to periodicals. In 1818 he published when he himself probably regarded as the best of his literary compositions, 'The Works of the Rev. Sydney Smith,' 3 vols. 8vo., with a preface by the author and a portrait. The collection consists of 'Letters written in Edinburgh to a Friend,' by Peter Pymble's Letters, and various occasional tracts. With respect to his contributions, he observes, 'I see very little in my reviews to alter or repel of. I always endeavoured to fight against truth, and what I thought evil then I think evil now. I am heartily glad that all our disqualifying laws for religious opinions are abolished, and I see nothing in such measures but unalixed good and real increase of strength to our establishment.' When he wrote this however, 'all our disqualifying laws' had not been abolished, as may be seen by looking over the act of parliament which is reprinted under the head Roman Catholics and Jews, P.C.S.

Sydney Smith is a very effective writer; he has considerable argumentative power, united with wit, humour, and poignant satire. His style is clear and forcible, without any apparent aim at elaboration or polish. Two or three letters which he published in the newspapers shortly before his death against the repudiation of their debts by certain States of North America are as strong in argument, as pungent in satire, and as effective in style in anything which he wrote in less than 1820. [Athenæum; Gentleman's Magazine; Preface to the Rev. Sydney Smith's Works.]

SOKE BALLS. [LIGHT BALLS, P.C.S.]

SOE. [ARTIST, P.C.S.]

SOCRATES, the ecclesiastical historian, was born at Constantinople towards the end of the fourth century. He was instructed in grammar and rhetoric by Ammonius and Heliodorus, of Alexandria, and afterwards followed the profession of scholastic or advocate, on which account he is generally designated as Sozomen the Scholastic. He appears, however, to have abandoned this profession in order to devote himself to the study of ecclesiastical history. He is generally considered the most exact and judicious of the three continuators of the history of Eusebius ('Eusebii P.C.); he is less florid in style and more careful in his statements than Sozomenus (P.C.), and less correct than Theodoretus ('Theodoretus, P.C.). He is likewise the earliest writer of the three, and Sozomenus is supposed to have borrowed some what largely from him. He died in 390 or 395; it has been eluded by Epiphanius the Scholastic in his 'Historia Tripartita,' and was published for the first time as a continuation of Eusebius, by Robert Stephens, Paris, 1634, 4to. The work is a poor translation by the Presbyter Conon. The history is divided into seven books: the five last are chiefly compiled on the authority of Rufinus ('Rufinus, P.C.), and on the relations he gathered from the church of a certain part of the church. He has two first had also been composed on the same authority; but on reading the writings of St. Athanasius he found that Rufinus had omitted several of the principal circumstances in the life of this celebrated father of the church. [Athanasius, P.C.]. He therefore undertook the task of writing these books, and took occasion of inserting several valuable documents and formularies of faith which throw much light on the Arian heresy.

Though the most exact of the continuators of Eusebius, he has nevertheless allowed himself to fall into error on several important points. For instance, he confounds the Emperor Maximianus with Maximinus (i. 1, c. 1), a mistake the more common from the similarity of the names. He professes to relate the principal events which took place in that city. 'The carelessness of writers of that age,' says Fould, 'in distinguishing between a Solinum, and a Solomon (the Dec. and Fall of the Rom. Emp., c. vii, note). He is also taken also respecting the number of bishops who refused to sign the creed drawn up at the Council of Nice (i. 1, c. 8), as it appears clearly from the acts of the council and the authority of St. Jerome, Theodoret, and others, that there were only two, not five, dissentients, as Socrates asserts. His statements respecting a law passed by the Emperor Valentinian authorizing bigamy (i. 4, c. 31), on the occasion of his marriage with Justina, rests on no other known authority, and bears the semblance of a fiction rather than a fact. His account of church discipline has been severely criticized by Baronius, Fleury, and other Catholic historians; but Socrates has this point been very ably defended by Cousin in the preface of the translation to his history. 'His impartiality is so strikingly displayed,' says Waddington, 'as to make his history a valuable source of information for the student of Catholic history; but Valensius in his life has clearly shown that there is no reason for such suspicion. We may mention another principle which he has followed, which in the mind of the modern student of church history is the most pithy in the valorousness of the Novatians, though he shows but little knowledge on the subject, and confounds Novatian, who was a priest of Rome, with Novatian of Africa. [Novatianus, P.C.]

The date of his death is not ascertained. [Hist. de l'Église, traduite par Cousin, vol. ii., Paris, 1775; Fleury, Hist. Ecclesi., l. xxvi. c. 49; Waddington, Hist. of the Church, London, 1833; Moret, Dict. Historique, art. Socrates.]

SOEUR, LE, HUBERT. This excellent sculptor, a Frenchman by birth, according to Walpole, was the pupil of the celebrated John of Bologna. He came to England probably shortly before 1630, in which year he was then living in Bartholomew Close, and a son of his was buried on the 30th of July, 1630, in the same that year in St. Bartholomew the Great. Le Sour must have been a man of about fifty years of age in 1630, for John of Bologna died in 1608 in Florence at an advanced age, and Le Sour must have visited Florence and the workshops of his master. Le Sour was born at Brussels, and in 1633 he was described as a sculptor of some distinction. His work was noticed by the French nobility and by the States-General. He was commissioned to execute a monument of William the Silent, which was never completed.

In 1633 Le Sour cast the well-known equestrian statue of Charles I., which was cast in a spot of ground near the church of St. Paul, Covent Garden, but when not put up before the commencement of the great civil war, it was sold by the Parliament to a brayer of the name of John Smith, living in the city near Holborn Comyns, who had orders to break it into pieces. Rivers instead of breaking it up, buried it, and it remained concealed until the restoration. It was placed in its present situation at the expense of the Duke of Lennox, according to the order from the Earl of Denby, afterwards Duke of Leeds. The statue was made of wood and at the expense of the family of Howard-Arundel, who have still the receipts to show by whom and for whom it was purchased. The year 1633 was chosen because it was the year in which he was destroyed himself when, after the statue was set up, he found that he had omitted the saddle-pitch; unfortunately for the truth of this
story, however, the saddle-girl is there, and further, Le Soeur can never have seen the statuette up, as he must have died several years before 1676. The figure is dignified and exalted, but does not possess much character in modelling; the hinder quarters are especially void of power and motion. The pedestal was made by Grinling Gibbons. Walpole speaks of a bust at Stourhead by Le Soeur, a noble head, but it is not of the same style as the dragon à la Romaine, three feet high on a black pedestal. It is mentioned in Vanderdoort's Catalogue of Charles the First's Collection. Le Soeur executed many other bronze or brass works in England, but they are now all lost or destroyed.

Walpole, Anecdotes of Painting, etc.; English Connoisseurs.

SOLIDITY. It is a condition of solid bodies in which the particles are held together by a cohesive power of small intensity: in consequence of this, such bodies change their figures upon the application of a small degree of force; and they do not recover their previous forms upon its removal.

This condition is the opposite of hardness, in which the particles are held together by a power of cohesion so great that they cannot be separated by any force which it may be convenient to apply to them. No body in nature is known to possess either of these qualities absolutely; but in contemplating the mechanical actions of soft bodies, balls of wet clay are generally used, while blocks of wood acting against one another, or the direct pressure of a body or other heavy weight, are used to illustrate the effects of hardness. Balls of glass or ivory, or steel springs, serve to show the mechanical actions of elastic bodies. [Conduitis on Frascati or Bozzia, P. C. S.]

SOLÉN [Tribute] (n.) In antiquity, the name of the coast of the province of York on the English coast, whose affinities are somewhat uncertain. Supposed to be Marsiliaeis. (Lindley.)

SOLIDA/GO (from the Latin, to make firm, on account of its solidity, applied to the stems of plants belonging to the natural order Compositae, the suborder Cynarinaceae, and the tribe Asteroidae. It has radiant heads of flowers, the florets of the ray pale-tomentose ligulate in one row; those of the disk, tubular, with stamens and pistil, the receptacle rather acetate, the involucre imbricated, with a few scales on the peduncle; the pappus pilose in one row; the fruit terete. This genus usually resembles the Erechtites, from which it is distinguished by its pappus in a single row, and its terete fruit.

S. Virgatae, Golden Rod, has an erect, slightly angular stem, the leaves lanceolate, narrowed at both ends; the lower leaves elliptical, stalked, serrated; the raceome erect, simple, or compound; involucral scales, lanceolate, acute; the fruit dawny. This plant is a native of the woods and thickets of Great Britain, and was formerly much used in medicine. Its leaves, dried and dried in the dried state, have been employed for internal hemorrhages. It is astringent and tonic.

SOLIDITY. For the signification of this word in its strictest sense, see the article on Brigade, P. C.; but, as the word is frequently employed to designate a condition of material substance in contradistinction from liquidity, or a gaseous form, it may in this sense be defined to be a state of a body in which the particles or molecules in it are so close together that there is no certain amount of force to separate them from one another; and, at the same time, they are subject to small variations only of their mutual distances by the application of any quantity of heat less than that which would reduce them to ashes or convert them into fluids.

The expansion of solids by heat is noticed under Heat, P. C.; see also Specific Heat, P. C.

SOPHIE, P. C.; see also SPRING, P. C.

SOPRANO. InCicero, called l'Alato Ciccio, a celebrated Neapolitan painter, was born at Neorca de' Pagni in 1657. He was originally intended for the law, but having a decided taste for art, he was at first taught by his father, who obtained for his son a scholarship and a place at the University of Naples under Francesco di Maria, and in the academy of Pietro del Po. Sopranò was one of the best and most correct painters of his time; he had great variety of figures, and his compositions were frequent and free. He had also a very great facility of execution. But his style in all its varieties belonged to the elegant and ornamental; his drawing is uniform, and in a great degree merely academical; his compositions were great; his figures, which appeared at once so much in their individualities, were much in the fashion of, under the title of 'Saul.' In 1810 he produced 'Constance de Castille, a metrical Poem, in Ten Cantos,' in the style of the 'Lady of the Lake' and 'Marmion.' In 1814 he republished 'Orestes,' together with four other tragedies. Both the
velled through France, Switzerland, and Italy in 1816, in company with Mr. Elmsley and Professor Playfair. He returned through Germany to England at the close of 1817. In 1827 he published a corrected edition of his translation of the 'Georgics,' together with the original text, and the translations of De Lille, Boase, Guzman, and others, in folio, with the preface of the sovereigns of Europe, and received medals from them in acknowledgment.

When he was in his seventieth year he commenced a poetical translation of The Iliad," of which he presented copies to the British Museum, on which occasion he received the gold medal of the British Association. In 1838 he commenced the 'Odyssey,' which he finished in July, 1839.

He died December 30, 1833, in the seventy-seventh year of his age. His eldest son William, who was a colonel in the First Regiment of Guards, died in 1816, in consequence of injuries which his constitution had suffered in the Walcheren expedition and the war in Spain. His third son George, who was assistant-resident at Nagpore, in Hindostan, was killed in repelling an attack of the Pindories, November 22, 1817. Another son, Hans, who had been in the civil service in India, died in London, April 27, 1827.

Besides the works already mentioned, Sotheby published, in 1813, 1814, and 1820, Poems, "Our English Prose Writers," containing the third edition of his 'History of the English Prose Writers,' and the second edition of his 'History of the English Poetry Writers.' His last work was a translation of the 'Dunciad,' by Pope, published in 1834.

Some of his later poems made little impression on the public, and are now nearly forgotten. His thoughts are pleasing, but faint, and frequently indistinct, from the polished diffuseness of his style. He has little originality or strength, but has great delicacy and elegance of manner, and of the whole a perfect level, and overgrown with shrubs, consisting of the Eucalyptus deusta and the Tea-Tree. Towards the southern extremity of the peninsula lying west of Spencer's Gulf, especially near Flinders's Bay, the hills are low, and have an elevation of between 600 and 800 feet; they consist of sandstone, and are covered with wood. The interior of the peninsula is low and barren, but interspersed with salt-lakes. It is called Gawler's Range, and is traversed by a narrow tract which extends from Flinders's Bay, and is between the hills and the salt-lakes, and is covered by scrub, with a few small plains. There are no rivulets or springs, but between the hills are small salt-water lakes, with miscellaneous plants growing round their margins; fresh water is only found after the rains in the crevices of the rocks. The country north of Gawler's Range has not been explored.

The country situated on the western shores of Spencer's Bay is of a much better description. It contains Port Lincoln, the most extensive and the best harbour in the colony. It consists of three basins: Spalding Cove, Port Lincoln, and Boston Bay, in each of which there is not less than ten or twelve fathoms water, with a bottom of mud and sand; and the whole of holding consists of shallow water. Round these extensive sheets of water are many large tracts well wooded, and others grassy with single trees dispersed over them. It is calculated, that in the vicinity of Port Lincoln there are three million acres suitable for cultivation or pasture. The peninsula south of Port Lincoln is hilly, but well wooded, and has much good pasture ground, and also the country north of it to the distance of ten or twelve miles; but farther north the hills disappear, and are followed by a low tract which extends along the shore, and is densely wooded with brush, among which are scattered a few small patches of grass. Water is only found near a few rocky elevations. At the back of this low and rather narrow tract is a moderately elevated table-land, whose edge is broken by deep gorges into portions resembling hills. The soil is deep loam, generally presents only here and there a little old withered grass. There are no high trees, but patches of scrubby bushes, and a few small plains. No water has been discovered.

The southernmost flowers, and the highest heath, are at the head of Spencer's Gulf, where a rather narrow low tract separates it from Flinders's Range. This tract is quite level, and has a sandy soil almost without vegetation. Flinders's Range constitutes the western extremity of a mountain chain of considerable extent. It occupies in width a space more than sixty miles from west to east, lying east of Spencer's Gulf. It may be said that this mountain tract terminates on the south of the banks of the Murray, and on the north of the River (25° 30' south) summit occur, Mount Bryan, 3000 feet high. From these parts it extends nearly due north, with a small declination to

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*(From a historical text, discussing the geographical and natural features of the Southern Ocean and related areas, with specific mention of the Iliad and the Odyssey translations by a noted poet.)*

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In its natural state it resembles a park, the single trees standing at considerable distances from each other.

The capital of the state is Adelaide. It is situated on the southern border of the Torrens, a river which rises in the hills about six miles east of the town. It can be called a river only in the rainy season, for in dry weather it is all but dry, and flows only during these periods of high velocity. In the dry season it consists of a number of expansions like small lakes, which are very deep and of considerable length, but rarely more than thirty or forty feet wide. These ponds are connected with one another by shallow places, in which the water is hardly a foot wide and an inch deep. At these places hardly a current is perceptible in the dry season. The Torrens in that season does not reach the sea, but instead it is in what is called a swamplike depression, overgrown with reeds, which is separated from the shores by the sandy down. When the river is full, the surpluses of water find their way to the sea by running from the Reid-Bed to the Creek. The Creek is an inlet, branching off from the Gulf of St. Vincent about twelve miles to the north-west of Adelaide. It runs about four miles eastward and then twelve miles southward, terminating not far from the Reid-Bed. Though there is a bank at the entrance of the creek, with only fourteen or fifteen feet of water over it, vessels of five hundred tons burden can sail up to Port Adelaide, which is only five miles from the town, and has a good landing-place. The coastal line in the reefs of Adelaide is brackish, that of the Torrens river is used for all purposes, and is even transported to Port Adelaide by rail.

The Murray is the largest river in Australia, and its remotest tributaries rise in the mountains which are not far from the eastern shores of that continent. [Australia, P., p. 121; Walms, New Beza, P. C., p. 38 and 44.] It enters South Australia near 89° S. lat., and flows for about eighty miles west, when it suddenly turns to the south, and runs in that direction to the sea; before entering into the sea it expands into a large lake, called Lake Victoria. This navigable river runs in a bottom inclined by higher ground, from twenty to forty feet above the bottom. The bottom is about four miles wide. As the river does not occupy the centre of the bottom, but inclines to either side according to its windings, the flats on its sides are of greater or less extent, according to the distance of the river from the base of the higher grounds. The bottom is level, and almost everywhere overgrown with high reeds. The soil is of the richest kind, being formed by an accumulation of vegetable matter, and as black as ebony; but as the destruction of the reeds would require much labour, no trial has hitherto been made to bring it under cultivation. Lake Victoria is about sixty miles long, and about eight miles wide in the widest part. It has no great depth, and is united to Encounter Bay by three channels of little depth; the shortest of these channels is four miles long. From the sources of the Murray, north of Victoria, boatmen have travelled, in which after two miles gradually expands into another lake of smaller dimensions, called Lake Albert. This lake is not connected with the sea, but separated from it by a sandy neck of land and the Gulf of St. Vincent.

The higher country between the Murray River and the hilly tract which forms the watershed between it and the Gulf of St. Vincent is rather hilly near the bend of the river, and overgrown with light woods; it appears to be adapted for sheep-walks. Nearer the sea the soil is sandy, and appears to possess only a small degree of fertility; but in the vicinity of Lake Victoria it is beautifully studded with cyrpress. The country east of the Murray is of a more barren description. The soil contains a much greater portion of sand, and it is covered in its natural state with low brush; large trees occur only at some spots. In some places it is covered with scrub, and in others it is sandy, with no indication of vegetation or water. The last-mentioned observation applies especially to the country which begins on the banks of the river, and extends to the eastern boundary of the colony.

The interior of the country, which, south of the parallel of Lake Victoria, extends from the sea to 141° E. long., is a desert; its surface being formed by a succession of low ridges or elevations, and shallow depressions in which only shrubbery grows. At the sea-mouth of the Murray begins a narrow arm of the sea, which extends along the shores and parallels to them over an extent of more than a hundred miles. In the vicinity of Lake Albert the open sea by a narrow strip of land covered with sand-
downs of moderate elevation. At the back of the northern half of the island there is a belt of high hills overgrown with casuarina, and between them numerous plains of moderate extent with a good soil; fresh water is found at a moderate depth under ground, rarely exceeding six feet. The rain ends in June; on the northern side of the island, the north-western side of the southern half of the Coroong there is a succession of salt swamps and low shrubby hills. A low range, called the Wombat Range, runs for twenty miles parallel to the coast. One side of the Coroong is of about three miles. Behind three miles of it is an extensive fresh-water swamp, several miles across, which appears to be subject to annual inundations. The soil of this swamp is similar to that of the flats of the river Murray. Fresh water is found in the swamp many small sandhills, well wooded and grazed.

The Coroong terminates near 36° 30' S. lat., but in the line of its continuation are a number of lakes, which are separated from the sea not by sand-dunes, but by grassy flats. At the back of the lakes are several grassy plains with a good soil, and wooded hills. South of Cape Bernouilli (near 37° S. lat.) the country improves. It consists of several ranges of wooded hills, generally running parallel to the shores, which are separated from each other by low level grounds, a great portion of which is subject to inundation; but the soil is excellent, and in many places these flats are dry and available for pasturage or culturization.

The south-eastern portion of South Australia will certainly become a very valuable country. A line drawn from Rivoli Bay nearly due east to the boundary-line divides it from the desert and from the north. Nearly the whole of the low ranges of wooded hills alternate with grassy plains and a few swamps. In approaching the higher country plains occur, which consist of caroong, covered with luxuriant foresta, consisting of trees of great size, blackwood, gum, stringy bark, and mahogany. They extend to the foot of Burr Range, a mountain-tract divided into several ridges, which cover a great extent of surface, and are pretty well wooded. The highest point of this range rises to about 1000 feet above the sea. Between this range and the isolated mountains called Mount Gambier and Mount Schank lies a well inclosed tract with large timber-trees, and an excellent soil. The two last-mentioned summits are of volcanic origin. Three distinct craters are visible on Mount Schank, which is between 900 and 900 feet above the sea. Mount Gambier is higher, and has also a crater on its summit. The soil of this region is of the richest description, being mostly a black brown loam, and the vegetation luxuriant. The value of this country for settlers is still increased by having a good and safe harbour in Rivoli Bay.

Kangaroo Island, which lies before the entrance of the Gulf of St. Vincent, is about 80 miles long from east to west, and on an average about 20 miles wide, which gives an area of 1600 miles. It rises steeply from the sea, and does not attain a great elevation, the interior being occupied by extensive plains. Close to the shore, within a quarter to half a mile from the sea, it is covered with a thick forest, but as you ascend the height is passed, and the country presents itself, which is covered with grass, and there are often hundreds of acres without a tree. In these plains are numerous ponds, and, near the shore, lagoons which are generally filled with fresh water, but some are salt. On the shores of Nepean Bay is a salt-lagoon, on the banks of which large masses of crystallized salt are found. It would seem that nearly the whole of the island is available for agriculture or pastureage. On its north-eastern shore is Nepean Bay, where vessels may ride in perfect security during the western gales.

It is true that by far the greater part of the territory of South Australia will never produce any food for man or animals, but the country is well suited for several very good tracts of land. It is probable that one-twentieth of the whole will either be brought under the plough or used as pasture-ground for sheep and cattle. This would appear to be a large country, the extent of which has not been ascertained, but it is probable that there are about 50,000 square miles.

As this country has only lately been settled, we are but imperfectly acquainted with its climate. No series of meteorological observations has reached us, and we must necessarily content ourselves with some general observations. The seasons are divided into dry and wet. The dry season begins at the end of August and continues to the end of March. In December and January, July, and August, the heat is very great, and the ground so arid, that the least breeze raises clouds of dust. During the wet season, from the end of March to August, it rains frequently and sometimes very heavily. The long droughts, with which New South Wales and South Australia are frequently visited, are less frequent in South Australia. It appears that the rain diminishes greatly as we proceed inland, and it is probable that it ceases entirely before it reaches the northern boundary-line of the colony. During the dry season the rains are exceedingly frequent in hard gales. In the dry season northern and north-eastern winds prevail. Frost has never been experienced, nor by any means of snow.

During the cold season a great number of whales visit the coasts of the colony, and are chased by British, American, and French vessels. The black whale is most frequent, but the sperm-whale also occurs. The native animals are the kangaroo, wallabbi, a sort of small wallaby, the genus, the opossum, and the dingo, or Australian dog. Birds are numerous, and distinguished by their beauty. The emu, several kinds of parrots, of cockatoos, partridges, and quails are common. The most common sea-fowl are pelicans, black swans, wild ducks, divers, waders, coromants, and Cape-pigeons (Procellaria Capensia). Several kinds of fish are taken in the sea, as salmon, snappers, porpises, and large and small sharks. There are several kinds of snakes and lizards; among the latter the iguana, which is eaten; among shell-fish, oysters and periwinkles are mentioned as plentiful.

The colonists have imported horses from Tasmania and New South Wales, and ponies from the island of Timor in the Indian Archipelago; cattle and sheep from the Cape, Tasmania, and New South Wales; and hogs from New Zealand. Fowls are common, both the common species and the larger one from the South Sea Islands, and both the small and large breeds of the bull-dog and greyhound, and used for chasing the emus and kangaroos; such a dog is often sold for 25 or 30 pounds sterling.

The woods of South Australia contain many large trees, but the timber is not much valued; and this article is imported from New South Wales and New Zealand. All kinds of grain have been introduced, and appear to succeed pretty well; maize grows well, and also potatoes; melons, water-melons, pumpkins, and cucumbers attain an uncommon size, and also cauliflowers. Onions are cultivated to a great extent in Kangaroo Island. Our fruit-trees do not appear to grow well, except the peach, and there is a small kind of lemon; for apples, pears, &c. the climate appears to be too hot and dry. The vine has not succeeded, but probably it will. No edible fruit is indigenous, except some berries, which are eaten by the natives.

It appears that South Australia is rich in minerals. Iron-ore has been found in many places, especially in the deserts; but it will probably never be turned to account, for want of fuel in these parts. Copper-ore has also been found at some places in the vicinity of the settlements; and a quantity has already been shipped for England. It is stated that this ore contains 14 per cent. of copper. There are numerous deposits of salt in the deserts; and there is also a salt-lagoon on Kangaroo Island, and others on the coast of the colony which lies to the east of Lake Victoria.

The natives of South Australia, like those of New South Wales, belong to that race which is called Negro Australian; but it appears they have not yet attained an equal degree of civilization with the native population of the eastern coast of Australia. This however may partly be the effect of the shorter duration of their communication with Europeans. When their hunger is satisfied, nothing can induce them to work, but when pressed by want of food they are ready to do any kind of labour for the colonist, especially carrying water or wood. It seems therefore that by able management they perhaps could be accustomed to some regular work, especially if there were a few flocks of domestic sheep. Though it appears certain that all the natives of the southern and eastern coast of Australia speak the same language, a marked difference exists in the dialects spoken in different parts of the same country. The language spoken by the natives of South Australia; one is spoken by the few isolated families which live in the eastern districts west of 136° E. long.; another by the inhabitants of the vicinity of Adelaide; and the third by those who wander about on the banks of the Murray River. A native of King George's Sound, in West Australia, who accompanied Mr. Eyre in his journey to our June and July, speaks the language spoken by the families of the Australian Blight.

The settlement of Adelaide was founded in 1836; but six or nine months previously some families had settled on
Nepean Bay, on Kangaroo Island, at a place called Kingscote. At the close of the voyage it was very great; and in 1840 the number of the white population was estimated at 15,000. In 1838 the colonies of Port Phillip and New Zealand were founded; which offered greater advantages for the settlement of Spanish emigrants than to those countries; and since 1840, very few have gone to South Australia. The white population at present probably does not exceed 20,000 individuals. The greater number of emigrants was not made till the settlement of the vicinity of Adelaide. A settlement exists at a place a little above the influx of Murray River into Lake Victoria, called Wellington. The settlement at Kingscote has been mentioned above.

There is also another on Spencer's Gulf, at Port Lincoln.


SOUTH SEA BUBBLE. The original conception and establishment of the South Sea Company was a project of Queen Anne's minister, Harley (afterwards Earl of Oxford), soon after the greatest weight in the House of Commons was removed in favor of the Government. The object of this company was to provide the means for paying interest at 6 per cent. upon, and eventually discharging, certain arrears which had accumulated upon the navy, victualling, transport, ordnance, and other departments, amounting, together with a new loan of 500,000l., to 9,471,325l. in all. For this purpose the crown was authorized by stat. 9 Ann. c. 21, entitled 'An Act for making good deficiencies and satisfying the public debts, and for creating a corporation to carry on a trade to the South Seas, and for the encouragement of the Fishery,' &c., to incorporate all the persons interested in any of the bills, tickets, debentures, or certificates, or other public debts, deficiencies, or sums of money, intended to be provided for by the act, into a company; whose stock should consist of the said debts, or claims upon the public; and in which should be vested, from the 1st of August, 1711, for ever, the sole trade and traffic into, unto, and from all the kingdoms, lands, countries, territories, islands, cities, towns, ports, havens, creeks, and places of America, on the east side thereof, from the river of Aranoco to the southernmost part of the Terra del Fuego; and, on the west side thereof, from the said southernmost part of the said Terra del Fuego, through the South Seas, to the northernmost part of America; and into, unto, and from all countries, islands, and places, within the dominion of Spain, in the crown of Spain, or which shall hereafter be found out or discovered within the said limits, not exceeding 300 leagues from the coast of America, between the southernmost part of the Terra del Fuego, and the northernmost part of America, on the west side thereof; except the kingdom of Brazil, and such other places on the said east side of America as are now in the actual possession of the crown of Portugal, and the country of Surinam in the possession of the States-General of the United Provinces. On the 8th of September, 1711, a charter was granted establishing the company by the name of 'The Governor and Company of the Merchants of Great Britain trading to the South Seas and other parts of America.' The establishment of the South Sea Company went for a time to the honor of the House of Commons. It was anticipated that it would pour a continued stream of gold and silver into England from the mines of Mexico and Peru. In point of fact however, the trade which the company engaged in was altogether a failure. 'By the peace of Utrecht,' says Coxe (Memoirs of Sir Robert Walpole, i. 127), 'Spain and the Indies being confirmed to Philip V., that monarch was too jealous to admit the South Sea Company. Many of them were speculators in the advantageous commerce which Oxford had held forth; the Company obtained only the Asiento contract (P. C., ii. 508), or the privilege of supplying the Spanish colonies of America with provisions. There was no such thing as a demand for Spanish America an annual ship, limited both as to tonnage and value of cargo, of the profits of which the King of Spain reserved one fourth, and five per cent. on the other three fourths. The disappointment was attempted to be counteracted by the declaration made by Oxford, that Spain had permitted two ships, in addition to the annual ship, to carry merchandise during the first year to the northern coasts of Spanish America; and the nomination of the several ports where the Company had leave to trade and settle factories. But the grand benefits of this commerce were never realized. The first voyage of the annual ship was made in the following year, and the trade was suppressed by the rupture with Spain. Their effects, factories, and servants were seized and detained, notwithstanding the agreement in the Asiento which allowed, in case of a rupture, eighteen months for the removal of their effects.'

This was the state of its affairs when, in the year 1719 or beginning of 1720, the ministry of Sunderland and Stanhope secretly entered into arrangements with the Company for having the whole amount of the National Debt, amounting to above 30,000,000l., transferred into its stock upon certain conditions. In conformity with what had been agreed upon between the parties, the Directors of the Company, on the 29th of January, 1720, sent in their proposal to the House of Commons, engaging to pay 3,500,000l. for the liberty of increasing their capital by being thus constituted the sole national stock. The mistake of the ministry was disappointed in their expectation of the scheme being at once assented to by the House. It was suggested that other proposals should be invited; and Walpole, who had already committed himself, having support from the Commons, it was agreed after some debate that the matter should be thrown open to competition. In consequence, on the 27th of February they sent in a second proposal in which they offered to pay 3,750,000l. Upon this a General Court of the members of the South Sea Company, the Directors were instructed to obtain the preference cost what it would; and on the 1st of February they sent in a second proposal to the House of Commons offering with paying 7,422,400l. 'A bill for a second proposal on the same day, which was supported by Walpole; but on the representations of Aslieble, the chancellor of the exchequer, it was resolved that the proposal of the South Sea Company should be accepted.' A bill effect was forthwith brought in, which, after several debates, passed the Commons on the 2nd of April, by a majority of 172 to 65, and the third reading of which was carried on the 7th in the Lords without a division. The same day it received the royal assent, and became the statute 6 Geo. 1. c. 4.

The imaginary advantages accruing to the Company from this arrangement instantly produced a great rise in the market value of its stock. The profits of the scheme were enumerated by Coxe as being expected to arise from—'1. The exclusive advantages of the trade, which, although precarious, and depending on a peace with Spain, were stated at no less than 30,000,000l. a year; 2. The monopoly of the trade, or monopoly of the consumption, which was to be proportioned to the augmentation of their stock; 3. The difference of receiving five per cent. for the money expended in purchasing the public stock, as against the usual interest of but four per cent.; 4. The great addition to their wealth from the constant rise in the price of the stock in consequence of the artificial use made to enhance its value; on which the whole success of the scheme depended.' 'The promoters of the scheme,' adds Coxe, 'highly exaggerated the profits; rumours were at the same time spread that the Company, by monopolizing the fund of the whole national debt, would reduce Government to the necessity of applying to them for loans, which would be advanced on their own terms; and it was even insinuated that the proprietors would obtain, by the weight of their wealth, a seat in the cabinet, or a place in the ministry.' The consequence was that the price of the stock, which at Christmas, 1719, stood at 126, had risen by the 14th of April to 326, and by the end of August to above 600. Meanwhile it had been started by the rage and fury of speculation which this rapid ascent of the Company's stock had excited; and all or almost all of these also, incredibly visionary and absurd as it was, contributed with temporary success. In Anderson's History of Commerce a list of nearly two hundred of these minor bubbles is given. About Midsummer it was calculated that the value of the stock of all the different companies amounted to 100 millions, and it exceeded five hundred millions sterling. Now however the South Sea Company, envied in the midst of its own prosperity...
of that of its rivals, procured writs of scire facias to be directed against certain of the other companies. The effect was instantaneous and universal. Alarmed by the apprehension of prosecutions by the law officers of the crown, the subscribers to the ‘Ships for India’ bond, especially those owning a larger proportion of the shares for whatever they would bring, more eagerly than they had done to purchase them; the panic quickly spread through the whole extent of the share-market: the proprietors of the vessels were hurried to the exchanges, and legally incorporated companies, subsequently, by the general aspect of things around them, began to perceive that their stock too must have its point of highest elevation, from which it would as inevitably descend as would after a certain time the tide, from the mouth of a stream, and under the impression South Sea stock itself soon began to tumble down. By the 32nd of August it had fallen to 820; by the 30th it was at 780; by the 8th of September at 680; by the 20th at 410; by the 25th at 176. The bubble had burst.

It would require a great deal of space to tell the rest of the story of this remarkable financial inflation and fever. A searching parliamentary investigation into the proceedings of the directors of the company followed in the next session, which produced many most scandalous disclosures, some of them affecting the most eminent persons in the country. The directors were all mulcted of the greater part of their fortunes; Atkyns, the chancellor of the exchequer, was expelled from the House of Commons; Crags, the secretary of state, would probably have shared the same fate if he had not died of small-pox in the course of the proceedings, his son being called to the bar on the 28th of December; Somerset House was of course attacked by the disease shouldering up the island was with difficulty saved by the influence of Walpole; Stanhope, who was not supposed to be implicated in the fraud and scandal, was first游戏角色 blood vesSEL was breaking upon him, a subject in the House of Lords, and expired the next day. Not only the royal mistresses, but the Prince of Wales, and even the king himself, were believed upon strong grounds to have profited largely by stock which they were favourably placed for selling at the most advantageous moment, and all or the greater part of which they had obtained without purchase.

The storm thus raised was weathered and slaved, and public credit restored, principally by the great financial talent of Walpole, who assumed the direction of affairs as first lord of the treasury and chancellor of the exchequer in February, 1721, and kept his post at the head of the government for the next twenty-one years. Even the affairs of the South Sea Company were by the measures which he adopted restored to some degree of real prosperity for a time; but its commercial operations never became of any consequence; and the members became at last mere government annuitants, till, all their claims having been satisfied, the company was finally dissolved only a few years ago.

It has been forgotten that the South Sea Bubble in England was coincident in point of time with the later stage of the famous Mississippi scheme of Law in France; but what real connection there may have been, if any, between the one and the other is a matter of question.

(Prestwich’s Historical State of the South Sea Company; Anderson’s Chronological Deduction of Commerce; Macpherson’s Annuals of Commerce; Crook’s History of British Commerce; Cusack’s Memoirs of Walpole; Malcolm’s History of London; Parliamentary History; Statutes at Law.)

SOUTH, ROBERT, LL.D. The little that there is to be told of the life of Southey beyond the account of his literary performances may most conveniently be given by itself in the first instance. He was one of several sons of a linen-draper in Wain-street, Bristol, where he was born—his name is found in the list of August 1774, but, according to the inscription on his tombstone, on the 4th of October in that year. His first teachers were, a Baptist clergyman named Foot, said to have been a man of no ordinary ability, to whose school he was sent when he was six years old; then a Mr. Flower, at Corston, near Newton St. Loe; then a Mr. William Williams, a Welshman (something dropped into his mind by which he may have been suggested the subject of his ‘Mabinogion’). At last, in 1788, he was placed at Westminster school, the expense of his education from this time, it is intimated, being borne by Mr. Hill, a brother of his mother, who was an officer second in command at the Cape of Good Hope. His father, we suppose, was now dead. In 1792, leaving a distinguished reputation at Westminster, where however he had incurred censure for taking part in a rebellion against the head master, Dr. Vincient, in 1790, he was sent to Baliol College, Oxford, his uncle’s intention being that he should enter the church. But it was almost unavoidable that his enthusiastic temperament should precipitate him into the so-called liberal opinions both in religion and politics which the French Revolution had inspired, and which he propagated both in France and in this country; he went to the extreme of free-thinking on both subjects; and in 1794 he left Oxford. He and a fellow-townswoman, a young Quaker named Mrs. Lovell, who was also at Oxford, and in 1794 the strength of this aversion for the Roman Church prompted them to leave England, and they became friends and associates of Coleridge. They lived for a time in Swiss places, with their joint fortune—amounting to about £2000, in money, besides a valuable library, which was afterwards disposed of by auction in London.

Southey’s publications are very numerous. The following list of those of them that appeared separately is probably not quite complete, although we have taken great pains to make it so; but, at this, we believe, much the fullest that has been drawn up:

In 1794, Poems, in conjunction with his friend Lovell (as stated above on the authority of the Gentleman’s Magazine), under the title ‘Poems’ (12mo, 2 vol. 6vo).

In 1795 (according to Lowndes’s Bibliographer’s Manual), Poems, containing the Retrospect, Odes, Elegies, Sonnets, &c., by Robert Lovell, and Robert Southey, of Baliol College, Oxford, 2 vol. 6vo.
In 1796, Joan of Arc, an Epie Poem, 4to.
In 1797, Poems, 5vo.—Letters written during a short residence in Spain and Portugal, 12mo.
In 1799 and 1800, The Annual Anthology (a miscellaneous collection of poetry, of which he was the editor and principal writer), 2 vols. 8vo.
In 1800, The Thalassa the Destroyer, a Metrical Romance, 2 vols. 12mo.
In 1803, Amadis de Gaul (a prose translation from the Spanish version by Garcia Ordoñez de Montalvo of that romantic novel, originally written in Portuguese by Vasco de Lobeira), 4 vols. 12mo.—The works of Thomas Chatterton (in conjunction with Mr. Amos Cottle, the Life, originally printed in the second edition of the British Antiquties, being by Dr. G. Gregory), 3 vols. 8vo.
In 1804, Metrical Tales, and other Poems, 8vo.
In 1805, Madoc, a Poem, in Two Parts, 4to.
In 1808, The Chronicle of the Cid, Rodrigo Diaz de Bivar, from the Spanish, 8vo.
In 1810, The Curse of Kehama, a poem, 4to.—The History of Brazil, vol. i. 4to.
In 1812, Omnia, 2 vols. 8vo.
In 1815, Life of Lavoisier, 8vo.
In 1814, Carmen Triumphale for the commencement of the year 1814, 4to.—Ode to the Prince Regent, the Emperor of Russia, and the King of Prussia, 4to.—Roderick, the Last of the Gallaerts (a poem), 4to.
In 1816, The Lay of the Laureate; Carmen Nuphila (a poem on the marriage of the Princess Charlotte), 12mo.—A Poet's Pilgrimage to Waterloo, 8vo.
In 1817, Wat Tyler, a Dramatic Poem (written, in a vein of ultra-Jacobinism, in 1784, and now surreptitiously published), 12mo.—A Letter to William Smith, Esq., M.P. (on the subject of the preceding publication), 8vo.—Morte Arthur (a reprint of Sir Thomas Malory's prose romance), with Introduction and Notes, 3 vols. 4to.—History of Brazil, vol. ii. 4to.
In 1819, History of Brazil, vol. iii. 4to.
In 1820, Life of John Wesley, 2 vols. 8vo.
In 1821, A Vision of Judgment (a poem in English hexameters), 4to.—The Expedition of Ozma and the Crimes of Aguirre (partially printed in 1821, in the Second Part of the 12th Volume of the Edinburgh Annual Register, for 1810), 12mo.
In 1822, Letter to the Editor of the Courier Newspaper, dated Keewick, January 5th, and published in the Courier of January 17th, 1821 (a poem politique written by Lord Byron to the tragedy of the Two Pencans).—Remains of Henry Kirke White, vol. iii. 8vo.—History of the Peninsular War, vol. i. 4to. (an expansion of what had been originally published in the 12th and 13th Volumes of the Edinburgh Annual Register, 1810, &c.)
In 1824, The Book of the Church, 2 vols. 8vo.
In 1825, A Tale of Paraguay (a poem), 12mo.
In 1826, Vindiciae Ecclesiae Anglicanae, &c., 8vo.
In 1827, History of the Peninsular War, vol. ii. 4to.
In 1829, Sir Thomas More; or, Colloquies on the Progresses and Prospects of Society, &c., 2 vols. 8vo.—All for Love, or The Sinner well Saved; and The Pilgrim to Copamottela, or A Legend of a Cock and a Hen, 12mo.
In 1832, Essays, Moral and Political, 2 vols. 8vo.—Selections from Southey, Prose, 12mo.—History of the Peninsular War, vol. iii. 4to.
In 1833, General History of England, vol. i. 12mo. (in Lardner's Cabinet Cyclopaedia); completed in 5 vols. in 1840.
In 1834, Dr. Watts's Poems, with a Life of the Author (Cattermole's Sacred Classics), 12mo.—The Doctor (anonymous, and never acknowledged, but believed to be Southey), vol. i. and ii. 8vo.

In 1837, The Poetical Works of Robert Southey, collected by himself, 10 vols. 12mo.—The Doctor, vol. iv. and v. 8vo.—Life of the 1st Earl of Selkirk, post 4to. (according to Lowndes, who however gives no date).

To these works, making in all above a hundred volumes of various sizes, are to be added numerous papers upon history, biography, and miscellaneous literature, published in the Quarterly Review, to which he was a constant contributor from its establishment in 1809, till head and hand would work no longer. He also wrote for some years the historical portion of the Edinburgh Annual Register, and contributed other matter to that work, which began to be published in 1810, and was discontinued in 1824. He was besides one of the most regular and voluminous of letter-writers; and large collections of his letters are understood to be in existence, which it is to be hoped will, ere long, be given to the world. Some have already appeared in Robberia's Memoirs of the Life and Writings of William Taylor, of Norwich, 2 vols. 8vo, 1842.

As a poet, Southey cannot be placed in the first rank even of the poets of his own time. Wordsworth and Coleridge, Shelley and Keats, Byron and Scott, Moore and Crabbe and Campbell, whatever differences of opinion there may be as to their relative merits or their positions in reference to one another, will be generally admitted to have each and all shone more brightly as a mere director which was wanting in him. The light which was original in him shone upon one other, shone, even when it shone the strongest, to be only reflected light in him. In mere fertility he was equal to any of them. But his mind, although it was certainly not an inventive or constructive mind, returned much mind to the seed deposited in it, and communicated to it comparatively little of any new nature or quality. His imagination might even be said to be both apulent and gorgeous; still there was wanting the true spirit of life, that which distinguishes a real thing from a painted show. No natural human voice coming from the poet himself animated his verse; but rather an artificial sound, as from a flute or an organ. Such poetry may be both beautiful and majestic; but it fails permanently to interest, and will not live. For there is nothing so alien from and so fatal to poetry as any admixture of the mechanical. It acts like a dead substance imbedded in a living body. Witness such an instance as that of Darwin. There is much rhetorical splendour however in parts of Southey's poetry; especially in his 'Curse of Kehama,' and in his 'Roderick.' And some of his ballads and other shorter pieces, flowing on as they do in the easiest and purest English, are very happy.

In his prose writings the great merits of his style show to all advantage. It is essentially a prose style, and one turned to poetry by his high order, by some of the very qualities that constitute its characteristic excellence. Its facility and fluency, running into some degree of diffuseness; its limpid perspicuity; its equbility and smoothness; its power (as I say) of passion, the rapidity, the boldness, the novel combinations of poetry. Both in its merits and in its defects Southey's style may be compared to glass, which perfectly transmits the light, but refuses it not of the rise to any splendour of elegance; it has little or no brilliancy of any kind; but whether for narrative, for exposition, or for animated argumentation, it was perhaps the most effective English style of the time. It combines in a remarkable degree a somewhat lofty dignity with ease and idiomatic vigour, and is equally pliable to the expression of sprightly and playful as of severe and dignified sentiment. He certainly was not nearly so great a thinker as he was a writer. He had no subtlety of intellect, and he took rather a passionate than a reasoning view of any subject that greatly interested him. Much of his political and economical speculation is now printed originally written as another rather wrong-headed, even by the most ardent of his admirers. But there can be no question that he was thoroughly honest and in earnest in whatever opinions he at any time professed. He was, by the universal testimony of those who knew him best, a man of sincere, generous, high-minded nature, and in all the relations of private life a man worthy of the highest estimation.

Memoir in Gent. Mag. for June, 1845; Dictionary of Literary Authors, vol. ii.; Cattermole's Classical Literature; Literary Gazette; Athenaeum; and the works mentioned in the article.)

[SOWENS, EDWARD, P. C. S.]

SPACE, POWER OF PENETRATING. [TELESCOPES, P. C. p. 163]
SPALDING, SAMUEL, was born in London on the 30th of May, 1897. He furnished an example of success above the general average, of usefulness and usefulness, in the absence of any remarkable ability or aptness for its attainment. According to the testimony of his friends, he was only by means of great labour that he could perform his daily tasks with ease and without strain, and the steady progress which he made must have been much more at this early period of his life from a sense of duty, the effect of moral and religious training, enabled him to acquit himself with great respectability; and the moderate intelligence that he possessed appears to have done much towards forming those habits of unremitting application which constituted one of the strongest features of his intellectual character. At a suitable age he went to a public school, but had soon become too deeply interested in the study of theology to allow him to entertain the idea of spending his life in a secular profession. He now examined the evidences of Christianity was most astounded, and the work of Dr. Chalmers on this subject, together with the splendid discourses of the same writer on the relation of revelation to the discoveries of modern astronomy, inspired his mind with such elevated views of the grandeur of Christianity and the extensive benevolence of its design, that he resolved to devote himself to the pastoral office in the religious connexion to which he belonged, that of the Church of England. He frequently applied himself to study with fresh ardour, though he had to contend with a naturally feeble constitution, in which there is little doubt that the seeds of organic disease early existed. The contemplations of his mother's relations, was benevolence. In him it extended from the worm, which he would stoop to pick up lest it should be trodden on, to the highest order of beings. Whatever was capable of suffering or enjoyment excited his sympathy.

With a view to promote his object of qualifying himself for the ministry, Spalding devoted his time, for two years, to the study of the Greek and Latin languages, in private; and afterwards entered as a student of Christ's College, at Cambridge, where he made himself an exact Greek scholar. During his academical course here he obtained, in addition to high certificates of honour in other classes, five first prizes in the classes of Hebrew, French, Natural Philosophy, and the Philosophy of the Mind and Logic. Of the last subject his pursuit was ardent, his diligence and ability, as manifested in his essays and examinations, being such as to mark him out as a student of unusual merit. In the year 1839, symptoms of incipient pulmonary disease induced him to try the effect of a warmer climate, and he spent the winter in the South of France. On his return he underwent the examination for the M.A. degree in the University of London, in May, 1840. In the Transactions of the University, his name is mentioned with honour for his examinations in Animal and Vegetable Physiology, and in Law, Greek and Greek original and the History of the Holy Scriptures. He is also recorded as having passed a distinguished examination in Logic, the Philosophy of the Mind, and Moral Philosophy. In the latter he was so successful he was allowed by the examiners to write on some of these subjects; and this remarkable encouragement encouraged him to compose his work, entitled ' The Philosophy of Christian Morals.' In the autumn of 1840, Spalding went to Italy, where he remained nearly two years. It was during this period that the above-mentioned work was written, the subject of which however had occupied his mind for many years. On his return to England, in 1843, he published with great success the Treatise, but was prevented by the progress of his disease; and as a last resource he tried a sea-voyage, and went to the Cape of Good Hope, where he died on the 14th of January, 1843, about three weeks after his arrival. His work was published the same year, by his friends, in one volume, octavo. We have no space for any criticism of Spalding's theory of morals: we must restrict ourselves to a bare summary of his principal doctrines. They are as follows:—

1. Moral obligation is, first, virtue itself; and, secondly, the mode in which virtue ought to be displayed in the outward conduct. The great rule of action is, either to do to others what we expect others to do to ourselves.

2. The notion of moral obligation is an immediate consequence of the testimony of our moral emotions. The great object of moral approbation is the principle of benevolence; each of our actions, and each of our states of mind, is directed or cultivated in itself, to the direct or indirect advancement of this end. Thus, for example, we can have the notion of virtue or of vice, and by its reduction of all the forms of virtue to the one principle of benevolence. Without pronouncing either one way or the other on the merits of this theory, we will only observe that it possesses considerable originality, and abounds with passages of genuine power and beauty; and that it is characterised throughout by an elevation of thought and sentiment which distinguishes it even among books on ethical subjects. The author writes with the glowing warmth of one whose heart is in his work, sometimes with an intense ardour of feeling. The book is therefore of a popular cast, though it often discusses principles ably and profoundly. It exhibits also in a striking manner the real harmony subsisting between the Christian precepts and the genuine dictates of the moral faculty, notwithstanding apparent or supposed discordances. It exhibits a strong instinctive and party feeling, and exhibits very advantageously the benevolence which was a distinguishing characteristic of the author's mind.

Spathodesa, a genus of grasses belonging to the tribe Chlorideae. The flowers are paniculate, the glumes unequal, the upper long and acuminate; the paleae unequal, the outer boat-shaped, compressed, retuse; the styles elongated, united half-way up; the stigmas biform, protruding at the summit of the flower. There are two British species, the stricta and S. alterniflora. The former grows in muddy salt-marshes, the latter has been found only on the mud-flats of the river Irthing at Southhampton.

Spathodea (from spath, a spathe, in reference to the form of the calyx), a genus of plants belonging to the natural order Bignoniaceae. The calyx is spathaceous, cleft and toothed or entire on the other side. The corolla is funnel-shaped, with a 5-lobed rather unequal limb. The 4 stamens are divided into 2 long and 2 short, with the addition of a fifth sterile filament. The capsule silique-form, falcate, falsely 4-celled, and corky. The seeds are furnished with membranous wings. The species are erect shrubs or trees, rarely climbing shrubs. The flowers somewhat panicked, orange-coloured, yellow, or purple.

S. Rhodea has domed, lanceolate leaves, roundish downy leaflets, terminal erect racemes, and a much-curved slender corolla. The shoots are covered with a whitish down. The racemes the length of the leaves. The flowers white and purple. The fruit about a foot long, pendulous, twisted in various forms.

S. Rosbushii has its leaves three in a whorl or scattered impari-pinnate. The leaflets from 4 to 6, in pairs, serrated and smooth, with a roundish base. The corolla is terminal, purple and many-flowered. The fruit narrow and 4-celled. The calyx generally 2-parted, with the upper lip 2-cleft and downy. It is native of the Circassia. The branches are very spreading. The back grey, with a few scarious spots. The flowers large, rose-coloured, and delightfully fragrant. The limb of the corolla nearly equal, and elegantly waved at the edges. The species is remarkable on account of its scarlet leaves. The wood is employed for many purposes by the natives.

S. longiflora is an arborescent plant, and has large spreading terminal panicles, a bilabiate corolla, long pendulous slender sub-cylindrical follicles, with sharp edges and variously curved. The flowers are large, yellow, and very fragrant. The follicles very long. The wood of this tree is high-coloured, hard, durable, and much used for musical instruments and the like, the latter about the coasts of Coromandel and Malabar, where it is plentiful.

The species are splendid plants when in blossom. A mixture of the two is the reveller from best, and cuttings will strike readily in heat under a glass.

(Don, Garden's Dictionary.)

Spatularia, a genus of fishes of the Sturgeone tribe, remarkable for its mouth, which is only revealed by a prolonged and leaf-like form. The paddle-fish of the Mississippi is the type.
The difference between the specific heats at different temperatures is ascribed to the dilatations which the substances experience by an increase of heat; every change in the constitution of a substance is accompanied by a change of specific heat; a solid body, for example, has a smaller specific heat than the same mass in a liquid state. Thus the specific heat of water being unity, that of ice is 0.9.

With respect to liquids, Lavoisier and La Place have given a table of their specific heats, of which the following is an extract:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Specific Heat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury</td>
<td>0.99</td>
</tr>
<tr>
<td>Sulphuric acid</td>
<td>3.84596</td>
</tr>
<tr>
<td>A mixture of sulphuric acid and water</td>
<td>0.603162</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>0.61391</td>
</tr>
<tr>
<td>Water</td>
<td>1.0</td>
</tr>
</tbody>
</table>

The specific heats of gases are still subject to much uncertainty, though many attempts have been made by eminent physicists. During the siege of Hamburg, in the winter of 1813-14, MM. Delarochelle and Bérard for this purpose was to transmit through the calorimeter a constant current of gas in a serpentine tube, the gas having been heated to the temperature of the sun's rays. The thermometer of bull's horn, which is easily visible to the eye, being placed in the instrument; and the gas, passing with its excess of sensible heat above that of the surrounding water, issued from the tube at the temperature of the water, the temperature of the gas at the exit being determined by means of thermometers. The following table contains the results of some of their experiments on different gases, the weights of the quantities of gas being equal and the specific heat of water being unity:

<table>
<thead>
<tr>
<th>Gas</th>
<th>Specific Heat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carbonic acid gas</td>
<td>0.9210</td>
</tr>
<tr>
<td>Oxygen gas</td>
<td>0.2361</td>
</tr>
<tr>
<td>Atmospheric air</td>
<td>0.0659</td>
</tr>
<tr>
<td>Nitrogen gas</td>
<td>0.0747</td>
</tr>
<tr>
<td>Olefiant gas</td>
<td>0.4207</td>
</tr>
<tr>
<td>Aqueous vapour</td>
<td>0.8470</td>
</tr>
<tr>
<td>Hydrogen gas</td>
<td>3.9386</td>
</tr>
</tbody>
</table>

The specific heats of volumes of the same gas, having equal weights, are found to vary with the density and elasticity of the gas.

SPEKTER, ERWIN, was born in 1806, at Hamburg, where his father, a native of Hanover, was settled as a merchant. During the siege of Hamburg, in the winter of 1813-14, his parents took refuge with their family in the house of the banker Dern, in Altona, where there was a good collection of pictures, and where Erwin made the acquaintance of the painter Herterich, who was also living in the banker's house, and had a studio there. In this studio, in which he spent nearly all his time, Erwin Speckter acquired his first instruction in art, and his natural taste rapidly developed itself. In 1818, when his father's bank became insolvent, the young Herterich erected a lithographic press, the first which was established in North Germany, and young Speckter made some attempts in portraits, and in drawings to illustrate the old Reinecke Fuchs and other old stories of the country.

In 1823 Von Rumohr returned to Hamburg from his second visit to Italy, and, being struck with admiration of the promising talents of Speckter, urged him on in his career, and particularly to study the movement of art in and about the neighbourhood. This led to an artistic tour which he performed in 1823, with a brother and another artist friend, through Schleswig and the neighbouring country. The chief objects of this journey were the carved altarpiece of Hans Brügmann at Schleswig (lithographed by Böhndel) and the picture of Menlling at Lübeck, the latter of which Speckter and his brother Otto published in lithography. These early works gave Speckter's mind the peculiar bias which at that time characterized the majority of the younger artists of Germany, and the arrival of Overbeck's picture of Christ's Entry into Jerusalem, for the Marien Kirche of Lübeck, confirmed the conviction of Speckter that the destiny of art in Germany, with the addition of academical drawing, Overbeck's picture has been lithographed by Otto Speckter. At this time Speckter's chief labours were indiscriminate studies from nature of every description, and portraits: his first oil-picture was a view of the Mansion-house of the House of Commerce. Overbeck's picture seems to have kept him by a species of awe from attempting such high subjects himself; he was also always guided in his studies by Rumohr.
In 1825 he visited Munich, and placed himself under the direction of Cornelius, who expressed great admiration for his ability; and, after the completion of his cartoon of the Resurrection of Lazarus, allotted him one of the stalls or loggias in the Munich Court, which he was to paint. He was much fresco with incidents from the lives of the greatest modern painters. Cornelius selected Fra Giovanni da Fiesole for Speckter, as peculiarly suited to his taste. Speckter, then almost forty years of age, received the commission with exultation, but he did not live to execute it, for the Fiesolets he was not ready for the frusco until many years after this date.

In 1827 Speckter returned to Hamburg, chiefly to be in the vicinity of the above-mentioned work by Overbeck, while he painted his picture of Christ and the Woman of Samaria; but the deep impression made upon him by Overbeck's pictures had a very prejudicial effect upon him, through his inordinate striving after abstract ideal representation. His own dissatisfaction with this work may be inferred from his immediate but still gradual change of manner; for in his next work, the Women at the Tomb, there is a far greater attention to dramatic probability, and a more prominent part given to colour. He painted at this time also several beautiful miniatures from sacred subjects. In 1830 he appeared in entirely a new character in his arabesque and mythological decorations of the house of the Syndics Sleevving near Hamburg. In September of this year, after the completion of these, he set out by Berlin and Dresden upon a long-intended journey to Italy. The constrained taste which had hitherto possessed him, though it was gradually yielding to his own experience, was finally subjected by the contemplation of the Italian works in the Museums of Berlin and Dresden, especially those of Filippo Lippi, Raphael, and the great Venetian masters.

Speckter arrived in Rome in January, 1831, after a short stay at Venice, from which is dated the first of his very interesting series of Letters from Italy, which, by the advice of Rumohr, have been recently published. He remained in Italy, chiefly at Rome and Naples, until the summer of 1834, when he was called to Hamburg to paint in Fresco the villa of Abendroth, then recently constructed by A. de Chatassmeuf. In Rome Speckter confined his labours almost exclusively to studies, and these are in the general spirit of Italian art, and quite in a different style from his early efforts. The only oil-paintings he painted in Rome were two of Allaso Women, in ideal characters, and a large picture of Saxon and Dalilah, which was purchased by Rumohr.

In the spring of 1835, though suffering greatly from asthma, Speckter commenced his frescoes; he had in the interim completed three of the principal cartoons: the subjects are from Greek mythology, and the figures are half the size of life. Two of the subjects were,—1, a winged Pegasus from the Muses, and the Hippocrene fountain, which springs from the kick of the horse (M. de Chatassmeuf describes the nymphs or goddesses of this piece as the Graces); 2, the Graces, in a grove of laurels, decorate the bow and quiver of Cupid, and offer him a cup of ambrosial drink; and 3, the Fates, lulled by the lyre of Cupid, have ceased their labours, and recline on couches; the distance is concealed by a curtain. The first of these designs, distinguished for the exquisite beauty of its forms, was completed in fresco, and the second was partly executed; the third was not commenced. His weak state forced Speckter to leave his work at the beginning of November, and he died on the 33rd of that month in 1835, deeply lamented by his friends, and by none more than Rumohr, who wrote a short account of the character, which is incorrect, and the biographical notice of him which precedes his letters. These letters, published in 1846, under the title of 'Letters of a German Artist from Italy,' (Briefe eines deutschen Küstlers aus Italien, 1832-1846, Leipzig, 1846), are full of interest in matter and reflections on art. Speckter's whole career is a remarkable instance of the power of nature over convention, which was not unknown to the modern artists. The personal attractions of art is gradually drew him from an abstract conventional system, in which art was only secondary to a peculiar sentiment independent of it, to the art itself, and for its own sake. Speckter's conversion to nature is not singular in the history of modern German art.

(Scrips. already mentioned.)

SPECTRUM, in optics, is a name applied to the elongated image of the sun which is formed on a screen in a darkened room when a slender beam of the sun's rays passing through a perforation in the wall or in a window-shutter has been afterwards transmitted through a prism formed of any transparent medium [Drasanzas, F. C.; and, for the dark lines, observed by Nipkow, in C.].

If a prism of crown-glass, and one of flint-glass, have their refracting angles of such magnitudes that the spectrum formed by one shall be of the same length as that which is formed by the other, and the red and violet rays of the spectrum may be in contrary directions, the red and violet rays of the spectrum will be united so as to proceed parallel to one another in the emergent pencil, but the dispersions of the intermediate rays, the magnitudes of which are diminished, will be preserved, and some colour will still remain in the image formed on the screen which receives the refracted pencil. This circumstance was first observed by M. Clairaut, and the coloured image was called by Dr. Blair a secondary spectrum.

When a spectrum is formed by a prism of crown-glass, the mean refracted ray meets the screen at the boundary-line between the blue and green spaces; but if a spectrum of equal length be formed by a prism of flint-glass, the mean ray, instead of being at that boundary, will be nearer the red or least refracted end of the spectrum; consequently, with flint-glass, the rays which suffer the least refraction occupy a smaller space, and the scale of those which experience by fraction occupy a greater length in the spectrum than they, respectively, occupy in a prism formed of crown-glass. On the other hand, when the one is of a perfect crystal the mean ray is nearer the violet end than it is in a spectrum formed with a prism of crown-glass, so that the least refrangible rays occupy a greater, and the more refrangible ones a less space in the spectrum produced by the latter medium. Hence, if a pencil of white light be made to pass through two prisms, one formed of crown and the other of flint glass, their refracting angles being such that the red and violet rays of the spectrum are united, there will be formed on the screen a short or secondary spectrum, its upper part, or that which is near the violet end, consisting of the green light which remains un refracted, and the lower part of the light formed by the union of the red and violet rays. If the bar of a window-frame be observed through two such prisms combined together, the upper side will appear to be fringed with green and the lower side with a purple tint arising from the blending of the red and violet rays.

But if a pencil of white light be made to pass through two prisms, one formed of crown-glass and the other of rock crystal, their refracting angles being such that the red and violet rays of the first spectrum are united, there will be formed a secondary spectrum in which the lower part is green and the upper part purple; or, if the bar of a window-frame be observed through such a combination of prisms, the light through the union of the object-glass, and, in the other, it will be surrounded by a fringe of purple light. (Breuer, Treatise on New Philosophical Instruments, p. 328.)

Prisms of three different media might be formed which would unite the rays of three different colours; the uncompounded colours, which are inclosed in the prism, are discernible, and that which remains when two differently coloured rays only are united, and Sir John Herschel, in the 'Encyclopedia Metropolitana' (art. Light, No. 445), proposes to call it a primary spectrum, the object-glass of which might be obtained by using a greater number of prisms, for the purpose of uniting with the former the rays of other colours; but the elimination of light caused by the employment of so many media would be considered an evil great enough to be proposed to correct.

Sir David Brewster has given the name of tertiary spectra to the images formed by the union of two prisms, such remains when the red and violet rays are united by causing a pencil of white light to pass through two prisms of the same medium, as flint-glass, with their refracting angles in opposite positions; in this combination the refracting angle of one
prism is greater than that of the other, and the pencil of light is about 1/8 in. in breadth) in the wall or in the window-shutter of a darkened room, and then through a still narrower aperture in an opaque screen placed a few inches from the object-glass of a telescope (the two apertures being parallel to one another and with the object-glass of the telescope), fringes produced by the diffraction of light at the edges of the aperture, being viewed through the telescope, assumed the appearance of spectra similar to those produced by the refraction of light through a prism of some transparent medium.

To these images Fraunhofer gave the name of spectra of the first class; they are composed of variously coloured light, the tints melting into one another by insensible gradations, and they exhibit dark lines as in the usual prismatic spectra.

When there was placed before the telescope a grating consisting of many very slender wires parallel to one another and to the aperture in the wall, and having very narrow intervals between them, such as a screen would form on either side of the image of the aperture in the wall, and beyond this, on each side, a series of spectra each consisting of variously coloured spaces, of homogeneous light, separated from one another by dark lines; these he called spectra of the second class.

When two linear apertures only were made in the screen at the object end of the telescope, there appeared in the field, between the image of the aperture in the wall and the first of the spectra, on each side, what Fraunhofer designated imperfect spectra of the second class; these consisted of coloured spaces similar to those in the spectra of the first class, but without the dark lines; and where a double linear aperture only were formed in the screen, there appeared, between the image of the aperture and the nearest imperfect spectrum of the second class, other spectra less distinctly formed than the latter, but without the dark lines; these he denominated spectra of the third class. No other classes of spectra than those which have been mentioned were observed on increasing the number of the apertures in the screen.

Many beautiful varieties of spectra were observed by Fraunhofer when the light was transmitted through three or a greater number of small circular apertures in a metal plate, and also through two frames, each carrying a number of slender wires much closer set together than the former; so that the wires in one were at right angles to those in the other.

*SPECULARIA* (so called from Specularia, Venus, a genus of plants belonging to the natural order Campanulaceae; it has a rotund capsule, a linear-oblong prismatical capsule opening by lateral pores between the calyx-segments. In other genera of the same Order, the capsule is linear, as in *S. hybridus* which it has been separated by recent systematicists. The species are small annual plants inhabiting the regions of the Mediterranean and the temperate parts of Europe. One species, the *S. perfoliata*, is a native of North and South America.

*S. hybridus* has a simple or branched stem, the leaves slightly crenate, wavy, oblong, sessile, the lower leaves spatulate; the calyx scarious, the segments lanceolate, longer than the corolla, shorter than the ovary. This plant is a native of the corn-fields of Great Britain, and is found commonly throughout the territory of the Mediterranean. There are several other species of this genus, all of which are worth cultivating on account of their showy flowers. The seeds should be sown in the open ground, where it is intended the plants should remain. By sowing the seeds in the autumn an early blossoming may be ensured in the following summer, and by successive sowings in the spring and summer they may be made to blossom for several months during the summer.

(Don. Gardener’s Dictionary; Babington, Manual of British Botany.)

**NOTE.** JOHN CHARLES SPENCER, THIRD EARL, will be best remembered by the title of courtesy. Viscount Althorp, which he bore from his birth, through, it may be said, the whole of his public life, and until within a few years of his death. George John, second Earl Spencer, and Lavinia, eldest daughter of P. C. S., No. 157.

Charles Bingham, first Earl of Lucan; and was born on the 28th of May, 1744. Like his father, he was deeply indebted for his love of literature and his munificent expenditure in the collecting of rare books, he was educated at Harrow; whence he was sent to Trinity College, Cambridge, where he took the honors of A. M.

In April or May, 1804, towards the close of the second session of the second Imperial Parliament, Viscount Althorp entered the House of Commons as one of the members for Oakhampton. A vacancy appears to have been made for him by the resignation of James Strange, Esq. On the 11th of February, 1806, on the formation of the Whig ministry of Mr. Fox and Lord Grenville, in which his father Earl Spencer took office as Secretary of State for Foreign Affairs, Lord Althorp was appointed one of the Junior Lords of the Treasury; and this appointment having vacated his seat, he offered himself for the University of Cambridge, which had been represented by the late premier, Mr. Pitt; the other candidates being Lord Henry Petty (now Marquess of Lansdowne), who was the new Chancellor of the Exchequer, and the present Lord Palmerston. The votes were, for Lord Henry Petty 381, for Lord Althorp 135, for Lord Palmerston 128.

To the next parliament, which met in December, 1806, Lord Althorp was returned at the head of the poll for the county of Northampton; and, after a severe contest, the opposition were, for his lordship, 2085; for the other member, William Ralph Cartwright, Esq., 1990; for Sir William Langham, Bart. (the defeated candidate), 1881. After this his lordship continued to be returned for Northampton for 17 years, from 1807 till March, 1824, when the Grenville administration was dissolved in March, 1807; nor did he again hold office till the accession of Lord Grey and his friends to power in November, 1830. During all this interval, although he did not come forward in debate so frequently as some other members, he was regarded as one of the steadfast supporters of the Opposition in the House of Commons; and, while he was making his way to the highest place in the confidence of his party, it is said that he always felt that there was no man on either side of the House whom the public generally held in greater respect for his universally admitted patriotism and freedom from the narrowness and vassalage of faction. Yet he was no temporizer for half- and half politician. On all the great questions of the day he took a decided part; and on most of the occasions on which his party made a stand against the government, he went as far with them as any of his colleagues.

In 1807, for instance, when he was supporting an address to the throne for a reduction of the number of the Lords of the Admiralty, and opposing the suspension of the Habeas Corpus Act, the maintenance of so large a standing army, the renewal of the Alien Act, and the additional grant to the Royal Dukes; in 1819 moving for an inquiry into the State of the Nation; in 1823 moving for a repeal of the Foreign Enlistment Bill, and opposing the bill for removal of the Irish soldiers; and in 1824 moving for a Committee of Inquiry into the general state of Ireland; in 1825 opposing the Suppression of the Catholic Association; in 1828 moving the first reading of the bill to repeal the Test and Corporation Acts, and opposing the grant of 2000l. per annum to the family of the late Mr. Canning.

Lord Althorp was also prominent for several years, about this period, in a series of economical attacks upon the Tory administration, and his house was the resort of a powerful section of the Whig party, who considered him their leader in the House of Commons. There were few questions of public importance, over and above those already mentioned, in which he did not take a practical and useful share; and his sound judgment, under all the vicissitudes and excitement of Parliamentary affairs, amply justified the confidence and attachment with which he was regarded by the party. There was about him, indeed, so much reality of purpose, such unostentatious manners, a bearing and simplicity so characteristic of the English nation, that a few sentences from him were equivalent to an eloquent exhortation from the pulpit. For Mr. Canning was a man of great ability; and though he was not fortunate enough on all occasions to escape censure, we believe it may be truly said that such censure generally emanated from individuals whose views had been frustrated by his policy. If we except the supporters of the mild left politics, he was not less in charity with all men than they

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were in charity with him. 'Honest Lord Althorp' was the current phrase by which his Lordship was recognised by the House of Commons and the public for many years.

The House, it is true, has been often led by what are called the Whig parties, and the Whigs particularly have never been wanting, any more than it was during his leadership, in distinguished talents and rare oratorical ability. We doubt however whether amongst the many distinguished persons who formed Lord Grey's administration, a single individual could have been selected who would have combined in himself the support of the great measures of the day so much popular confidence and support, and would have carried them through parliament with an industrious patience and an earnest equal amiability equal to Lord Althorp. To the honour of the House of Commons, character in public men has an authority there which stands its possession in lieu of more striking qualities; and no Englishman of our age need be ashamed, on being reminded of the great orators of the last generation, that for several years the public business was conducted by a gentleman whose language was as plain as his appearance, but who never spoke without effect, because his hearers well knew that he had no object but the honour and prosperity of his country.

In respect to the great questions which have since entered into politics and made so much influence for the last four years on the legislation and statements of the day, we mean those connected with the emancipation of trade and commerce, we have reason to know that Lord Spencer warmly sympathised in the progress of these liberal measures; and there cannot be a doubt that his influence and support would have been given to the policy and measures of 1846.

It will be remembered that upon the address to the crown in 1841, Lord Althorp was selected for the Chair of the House of Commons. In August, 1841, when the Whigs were in power and the stability of Lord Melbourne's government was at issue, he moved the address on that occasion, and emphatically declared himself in favour of free trade. There was an opposition of course, within a short period of his death, when he lost the confidence of a portion of his agricultural friends by an open declaration in favour of a total repeal of the corn laws; and we question whether Mr. Cobden ever gave greater proof of his attachment to the cause of free trade in the middle or the upper ranks than when he could appeal to the recorded sentiments of those devoted and so distinguished a farmer as Lord Spencer.

But to return to the narrative: In November, 1827, the Whig section of the Gaderich cabinet fixed upon Lord Althorp to be chairman of a Committee of the House of Commons, which it was proposed to appoint to take into consideration the general state of the national finances, and the premier (the present Earl of Ripon) appears to have given a qualified assent to that arrangement. But it was defeated, after a communication had been made to Lord Althorp, and his lordship had signified his conditional acceptance of the invitation, by the opposition of Mr. Herries, the then chancellor of the Exchequer. This affair led to the resignation of their offices both by Mr. Herries, and Mr. Huskisson, secretary for the colonies, and to the breaking up of the administration.

On 8th January, 1828, the reader is referred to the 'Annual Register' for 1828, pp. 3-12.

On the accession to power of the Grey administration in November, 1830, Lord Althorp was appointed chancellor of the Exchequer. His position, and the sound ability which he evinced in the management of great political and economical questions, with the universal confidence in his integrity, made him the ministerial leader in the House of Commons. No man probably had ever filled the latter post who possessed less of the gift of oratory; but the clearness and sound sense of Lord Althorp were considered ample sufficient to make up for that deficiency. Nor were the expectations of his friends disappointed. The task of carrying through the House both the Reform Bill and the Poor Law Amendment Bill devolved principally upon him; and not only the candour and patience and complete command of temper (often in very trying circumstances) which he never failed to evince, but his mastery of both measures in all their details, the readiness and accuracy of his recollection, and even the talent of exposition and advocated the reform of those studies to produce a general conviction that the difficult work he had undertaken could hardly, looking to all considerations, have been placed in better hands.

The appointment of Lord Althorp to a high ministerial office in the House of Commons was attended with the serious drawback, that his father, Earl Spencer, having already attained to the age of seventy-two, Lord Althorp was very little to be seen and suddenly called away both from the House of Commons and from his office, which could only be held by a member of that House. In point of fact, the leath of Lord Althorp and the death of his father had been reluctantly, by occasioning this change, broke up the ministry. [WHITFIELD IV.] When the administration of Sir Robert Peel and the Duke of Wellington, which succeeded, was obliged to resign in April following, and the Whigs came again into power under the premiership of Lord Melbourne, Lord Althorp, now Earl Spencer, was, as well as Lord Brougham, left out of the new cabinet.

It was understood that he declined to take any office; and indeed he was reluctantly induced to resume the Chancellorship of the Exchequer after giving in his resignation when Lord Grey finally retired in July of the preceding year. There can be no doubt that in losing him, the remnant of the original Reform cabinet, now deprived also of Lord Durham, Lord Stanley, Sir James Graham, Lord Ripon, the Duke of Richmond, Lord Carlisle, Earl Grey, and Lord Brougham, lost one of its chief stays, notwithstanding that Lord Lonsdale, Lord Melbourne, Lord Palmerston, Mr. Grant (now Lord Glenelg), Lord Auckland, Lord Holland, and Lord John Russell still remained.

What is said of Lord Althorp by the writer of the Memoir in the 'Gentleman's Magazine' is the more valuable as the testimony of a political opponent: — 'His sincerity was never doubted, nor the integrity of his motives. ... Up to the hour of his departure, he was ever the representative of the democracy of his country, which had not less interest for the benefit of those who had done him so much good, and for the esteem of the House, if he did not support its popularity; and no minister ever retired into private life accompanied with warmer wishes for his happiness, or a more general feeling of good will.

Earl Spencer had always been strongly attached to agricultural pursuits; and now that he was no longer relieved from official occupation, but had nearly withdrawn altogether from the world of politics and public life, he devoted his time to his farm, with more eagerness than ever to practical farming, the rearing of cattle, the patronage of agricultural associations, and whatever promised to advance his favourite science. 'Regardless of expense,' as he used to say, 'I provide for the views which I have just quoted,' he was almost invariably present at all the great agricultural meetings throughout the country. Indeed he may be said to have been the father of many, as he certainly was the patron of all. He was for many years President of the Smithfield Club; and, in the year 1837, in the course of his address to its members, he suggested the formation of the Royal Agricultural Society. Earl Spencer was the first President of this Society in 1838-9, when the meeting was held at Oxford, and again in 1844, when the meeting took place at Southampton. In the formation and operations of the Yorkshire Agricultural Society he also exerted himself, and was in every way marked by zeal than by a sound discrimination. His Lordship was President of the Yorkshire Society when its meeting was held at Doncaster in 1843.

Lord Althorp's son, John, was one of the original members of the Roxburghe Club (for the reprinting of rare and curious tracts), of which his father was the first President. He was also Vice-Chairman of the Council of the Society for the Diffusion of Useful Knowledge; and he was a liberal contributor to the fund raised for the 'Biographical Dictionary' which the Society commenced. Lord Brougham dedicated to him his 'Discourse on Natural Theology,' published in 1836, in an address in which he says: — 'I inscribe the Preface of those studies to you, because you have devoted much of your time to such inquiries — are beyond most men sensible of their importance — concur generally in the opinions which I profess to maintain — and have even formed the design of giving to the world your thoughts upon the subject, as I hope and trust you now will be moved to do all the more for the present address. Lord Brougham's 'Dialogues on Instinct,' first published in his 'Supplement to Political Theory,' in 1840, are also supposed to be carried on with Lord Althorp, neither whose political nor agricultural pursuits, he says, 'had ever at any time prevented him from cultivating a sound philosophy.'

In the study of which much of his leisure is always consumed.'

Lord Spencer died at his seat of Wiston Hall, in Nottinghamshire, on the 1st of October, 1845. He had married, in 1814, Esther, only daughter of Richard Acklow, Esq., of Wiston; but she died on the 11th of June, 1818, without issue; and his lordship was succeeded in
the peerage by his next surviving brother, Frederick, now Earl Spencer. (Memoir in Gentlemen's Magazine for Nov. 1846; Annual Register; Private Communication.)

SPEHERADA, a fossil plant from the Yorkshire coast. SPEHEROCOCITES, a genus of fucoidal fossil plants, from the oolitic series of the Yorkshire coast. (Prelim.)

SPEHERODUS, a fossil genus of fishes from the oolitic and cretaceous strata. (Agassiz.)

SPHERONICHUS, a genus of fossil Echinoderma from the Silurian and Devonian strata. (Hisinger.) Von Buch includes them in his family of Cycstidae.

SPHENACANTHUS, a fossil genus of fishes from the coal formation of Scotland. (Agassiz.)

SPHENOCUBIA, a genus of fossil fishes from the lias and wealden series of England. (Agassiz.)

SPHENOPHYLLUM, a fossil genus of plants from the coal formations of Europe and North America. (Brongniart.)

SPINDIFODA, a genus of fossil fishes from the London clay. (Agassiz.)

SPIDER. (Arachnida, P. C.) The habits of spiders have recently formed the subject of an interesting and valuable research by Mr. Blackwall, for the Advancement of Science, by Mr. Blackwall. This report, which is printed in the Transactions of that body for 1844, is full of new and curious matter. It touches on many points which have hitherto been imperfectly understood. There are also some valuable memoirs on the same subject in the later volumes of the Linnean Transactions, and several papers on new forms in the Annals of Natural History, by other authors. Also an important and elaborate account of the anatomy of some species by Mr. Tulk.

Of the discoveries of Mr. Blackwall the most interesting and extraordinary are the sexual intercourse of these animals, and to the purposes served by their palpi in aiding in the continuation of the species. The facts made known on this subject are among the most singular discoveries of late years. For their full and proper history, we must refer to the report mentioned. We shall quote only a passage respecting the reproduction of the amputated palpi:

"When the palpi of male spiders which had been amputated before the penultimate molt are reproduced also. (See experiments 8, 10, 11, 14.) Unexceptionable evidence in support of this singular fact is to be found in their reduced dimensions and integrity of form; but it will scarcely be denied that the original parts of the segments must have been removed with the detached palpi. That the function of the sexual organs is not in the least affected by their reproduction there exists the same and necessary proof. In the last of the experiments, having for their object the determination of the mass of sexual organs in male spiders, recorded in this report, the male Tegevaria civilis, stated to have possessed the right palpi, and a single pair of left palpi, was observed to have a mass of sexual organs that was the subject of experiment 8 in the foregoing series; consequently its sexual organs had been reproduced, yet the fertility of its mate bore ample testimony to the unimpaired efficiency of their generative agency." Mr. Blackwall adds some very curious facts respecting the reproduction of spiders' limbs generally:

Physiologists, in conducting researches relative to the formation of the limbs of insects, seem to have limited their investigations to the legs of those animals; whereas in the experiments detailed above, the palpi and spinners, as well as the legs, were operated on; and all these parts are found to be renewed, and afterwards to have their dimensions enlarged at the period of moultmg only; it appears also, that if a part of a limb be amputated, as the tarsus of a leg or the digital joint of a palpus, the whole is reproduced, all the joints of the new limb, though small, being proportionato to those of the corresponding limb on the opposite side, with the exception of the digital joint of the palpi of male spiders when the sexual organs are not reproduced, which is usually some 1.5 the size and half by that circumstance.

The following observations respecting the non-stopcrotically occasionaly presented by spiders, are of no small consequence in their bearing on specific determinations:

Variation in the colour and size of spiders of the same kind, resulting from differences in age, sex, food, climate, and other conditions of a less obvious character, as they conduct largely to the introduction of fictitious species, have long engaged the attention of arachnologists, while those arising from extraordinary organic modifications, in consequence perhaps of their less frequent occurrence, have been almost entirely overlooked. The importance of which cases of the latter description possess, in relation to physiology and systematic arrangement, will be best illustrated by a few examples:

1. A supernumerary eye, situated between the two small ones constituting the anterior intermediate pair, has been observed in an adult female Theridion filipes. The total number of eyes possessed by this individual was nine, and their arrangement symmetrical.

2. An immature female (Thomisus cristatus) had the two lateral pairs of eyes only; the four small intermediate were altogether wanting, not the slightest rudiment of them being perceptible even with the aid of a powerful magnifier.

3. A short but perfectly formed supernumerary eye, connected with the base of the taral joint of the right posterior leg on its outer side, has been noticed in an adult female Lycosa cambarica.

4. Deficiency of the right intermediate eye of the anterior row has been remarked in an adult male Lycosa cambarica.

5. The left intermediate eye of the posterior row was perceived to be wanting in an adult female Epeira icicinata, and the right intermediate was the same.

6. An adult female Cninospila atrata was found to be without the left intermediate eye of the posterior row.

7. The right intermediate eye of the posterior row in an adult female Epeira icicinata had one-eighth of the natural size, being merely rudimentary.

SPIKENARD. (Ramarstachis, P. C. S.)

SPLANANTHUS (from evulve, a spot, and dros, a Sower, because of its dots or specks), also an important and elaborate account of the anatomy of some species by Mr. Tulk.

S. acranthus has a branched diffused stem, opposite stalked broadly ovate leaves, obtuse at the base, truncate or somewhat cordate. The pedicels are one-headed, longer than the leaf. The heads thick, ovate, and discoidal. The scolotha cicatrices at the angles, bi-asturate or awl-shaped. The whole plant, but especially the involucres and receptacles, as a powerful stimulant of the salivary organs.

(Lindley, Flora Medican.)

SPINELLI, PARRI; a celebrated old Italian painter, was the son of Spinello Aretino, and was born at Arezzo, apparently about 1388-90, though his father was very old, upwards of seventy. This conjecture however rests only upon Vasari's statement concerning his date of birth, and the assertion that Parri died when he was fifty-six years of age, and on the date 1444, which is on the altar-piece of San Cristofano at Arezzo, which is attributed to him.

He was first instructed by his father, and was afterwards employed by Lorenzo Ghiberti in Florence as an assistant in preparing the celebrated gates of the Baptistry of San Giovanni, which were executed between 1402 and 1424. He painted chiefly in Arezzo, and Vasari enumerates many of his works, but few now exist. He returned to Arezzo, says Vasari, upon the death of his father, and after many years' absence, from which it would appear that the father lived further in the fifteenth century than is at present supposed; he is known to have been living in 1408, and his death is supposed to have happened about this time. Vasari's statement that he died in 1400 is probably a mistake as well as an error, as the account of Parri's assisting Ghiberti and returning to Arezzo at the time of his father's death and after many years' absence, is a complete contradiction to it.

Parri was an excellent colourist, and was the best practical fresco painter of his time; his draughtsmanship was also good, but his figures were too large in proportion; Vasari says some of them measured as many as eleven heads in height, and yet they were not ungraceful.

Varese, Vite d'Arte, &c.)

SPIRIFER, the earliest generic name assigned by Sowerby to a large group of fossil Brachiopoda, from the Paleozoic strata. (Delafield, Orthis, &c., since have been discovered from the Carboniferous.)

SPIRITUAL COURTS (Ecclesiastical Courts, P. C. S.)

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SPIROGLYPHUS, a genus of fossils from the mountain Jemstones of Ireland. (M'Coy.)

SPIROPORA. (Carceora, P. C. S.)
Spirex, an undetermined, probably Zoophytae genus of Silurian fossils. (Murchison.)

SPRANGER, BARTOLOMAEUS, a great maniriert, but a celebrated painter in his time, was born at Antwerp in 1569, a wealthy merchant, and after he had received instruction from several masters at Antwerp, he visited Paris and Italy, where at Milan he placed himself with Barnardo Gatti, called Solaro. From Milan he went to Rome, where he found a patron in the Cardinal Farnese, who introduced him to Pope Pius V., who commissioned Spranger to paint a picture of the Last Judgment, gave him apartments in the Vatican, and appointed him his painter. This picture of the Last Judgment, which contained about five hundred heads, was painted on a large sheet of copper, and after the death of the pope it was fixed over his tomb in the church of Santa Maria Maggiore, but must have been long since removed.

In 1576 Spranger left Rome to enter the service of the Emperor Maximilian II., at Vienna, to whom he had been recommended by John of Bologna. After the death of Maximilian he remained in the service of Rudolph II., who ennobled him in 1588. He visited his native place in 1602, after an absence of thirty-seven years, and was treated with great distinction by his countrymen. He returned again to Frankfort, where he was about 1626, spending in that town his last years. There are nineteen pieces by Spranger in the gallery of Vienna, and many in other German collections. He painted with facility, but his figures are heavy, gross, and distorted; he painted mostly religious and mythological subjects, which were utterly unfit for his style.

(Fiorelli, Geschichte der Malerei, &c.)

SQUALORIA, a genus of fossil fishes from the lias of Dorsetshire. (Hill.)

SQUARCIONE, FRANCESCO. This painter, celebrated for his superior acquirements as well as his great school and rich collections of works of art, was born of a good family in Rome in 1571, and after having lived in Greece and Italy, lived there in great affluence and distinction until his death in 1744. His house was one of the chief attractions in Padua. He was the master of Andrea Mantegna, who lived some time in Squarcione's house. From his very various school (he had 137 scholars) he was called the father and primo maestro of painters. He appears to have been more engaged in teaching than in practising the art.

(Venezian School of Painting, P. C., vol. xxvi. p. 212.) Vasari terms him erroneously Jacopo Squarcione.

(Ridolfi, Vita de Pittori Veneti, &c.)

SQUATTIA, a genus of carinuligous fishes, of which the Fish of the name of Brunnhusen. They differ from all the other sharks in the position of the mouth, which is cleft at the extremity of the snout; and not placed below, and in the position of the eyes, which, instead of being on the side, are placed above the mouth. The body is broad and flattened horizontally; the head is round. The dorsal fins are placed farther back than the ventrals, and there is no anal fin.

STADE DUTIES are so called from Stade, in the kingdom of Hannover, a town situated on the right bank of the Schwinge, three or four miles from where it falls into the Elbe, and 22 miles west by north from the city of Hamburg. The name Brunnhusen-Tolle is now more commonly used, from the village of Brunnhusen, at the mouth of the Schwinge, where there is a customs-house and a royal guard-ship, and where vessels are collected which are levied on vessels and merchandise passing up the Elbe. The original duties, which were regulated by a treaty made in 1691, were light, but were gradually increased by the Hanoverian government till they amounted to about 44,000 a year. The duties levied were about 42 per cent. of all sundries, more on some commodities and less on others. British vessels by a proclamation of Geo. II., December 1, 1736, were allowed under certain regulations to sail directly up to Hamburg, without coming to anchor at thealternatives of the Schwinge, as other foreign vessels were obliged to do.

By a convention between the King of Hanover and the other United States, an undertaking of Emperor of Austria, King of Prussia, King of Spain, King of Saxony, King of Hanover, Duke of Mecklenburg-Schwerin, Duke of Anhalt-Cöthen, Duke of Anhalt-Dessau, Duke of Anhalt-Bernburg, Free and Hanseatic town of Liibeck, and Free and Hanseatic town of Hamburg),

dated April 13, 1844, in conformity with articles 108 and 116 of Act of Congress of Vienna, of June 9, 1815, the Brunsheam Tolls were revised, regulated, and settled according to the convention.

By a treaty of commerce and navigation between the Queen of England and the King of Hanover, signed at London, July 32, 1844, British and Hanoverian vessels arriving at, or remaining at, any of the ports of either country, are mutually subject to no other or higher duties or charges than those which are now or shall hereafter be imposed upon the national vessels of the two countries on their arrival at, or remaining at, any of the ports thereof. All articles of the growth, produce, or manufacture of Great Britain or Hanover, which are or shall be permitted to be exported or imported in British or Hanoverian vessels, are mutually allowed to be exported or imported in vessels of either country, and no distinctions of duties or drawbacks shall be made. By article 6, 'From and after the 1st day of October, 1845, no other or higher duties or tolls shall be levied, as regards the tolls or charges known by the name of the Stade or Brunsheam tolls and charges, on British vessels passing up the Elbe to the point where the tolls of the Upper Elbe commence (that is to say, up to and including the town of Hamburg), or upon the cargoes of such vessels, than the tolls and duties which are specified in the convention between the Elbe-bordering states, which was signed at Dresden on the 19th of April, 1844, and in the separate articles, regulations, and rules of that convention.' However, to the following articles of British produce and manufacture (that is to say, yarn, thread, manufactures of cotton, wool, and linen, tin and tin plates, articles of iron and steel, iron crucibles, earthenware, and all sorts of ironware, including similar alloys of metals and manufactures thereof), it is agreed that the duty or toll to be levied, whether in British vessels or in vessels of any of the Elbe-bordering states, shall be only two-thirds of the duty or toll specified in the table.

The treaty is to continue in force till January 1, 1854.


STAINHAM, a formerly a market-town (and described as still being one in the Article Gloucester, P. C.), in the lower division of Wiltshire hundred, the civil and ancient county of Gloucester, about 3 or 3½ miles West of the town of Stroud, and about 30 miles N.W.S. of the town of Gloucester, and about 7 miles E. W. of Gloucester. The adjective to its name, St. Leonard, serves to distinguish it from two other Staines in the county, namely, the adjacent parish of King's Staines and the parish of Stanmore, nearly Winchcombe and about 1½ miles from the county. The area of the parish is 910 acres; the population at the different enumerations was as follows:—1801, 599; 1811, 608; 1821, 576; 1831, 942; 1841, 985; 1851, 966; 1861, 1088; 1871, 1201, namely 192 inhabited, and 19 uninhabited. There were none building. The village consists of three or four small streets meeting at the church, which is dedicated to St. Swithun, and is an
antient cross-church, with a tower at the intersection. The architecture is partly of the early English period, partly of later date. This church formerly belonged to a Benedictine priory, but in 1539, after the Reformation, it afterwards became a cell to Gloucester Abbey. There are some remains of the conventual buildings, which have been converted to domestic purposes. St. Leonard Stanely was annually met in this church in the month of July by the monks of the priory.

The church was produced or accelerated by a fire which, in A.D. 1686, destroyed nearly the whole town: it has some share in the clothing manufacture of the district, and has two yearly fairs, but they are of little importance. The living is a perpetual curacy of the clear yearly value of 200, but without a glebe-house fit for residence, in the rural deanery of Stonehouse, in the Archdeaconry of Gloucester, in the diocese of Gloucester. There were in the parish, in 1833, three small day-schools; one, with a small endowment, contained 14 children, the other two contained 42, giving a total of 56 children (25 boys and 31 girls), or only one in seventeen of the population, according to the census of 1831, under daily instruction. There were two Sunday-schools with 305 children, namely, 141 boys and 164 girls. The parish of St. Leonard Stanely is included in the parliamentary borough of Stroud.

(Parliamentary Papers; Ordealance Map; Foebroke's Gloucestershire.)

STANZIONI, MA'ASSIMO, Carullieri, a celebrated Italian sculptor, was born at Naples in 1855. He was the pupil of Caracciolo, but became afterwards the imitator of the great Bolognese painters, especially Guido Reni; he was called the Guido of Naples, and is considered the most correct of all the imitators of individual painting, painter, and was also distinguished for his frescoes. There are several excellent works by Stanzieni in the church of the Certosa, now an hospital, at Naples, especially the picture of St. Blasius painting the rules of order to his monks. In the same church is a picture of a dead Christ and the Marys, which, as it had somewhat darkened, Spagnoletto, through jealousy, persuaded the Carthusians to wash with a corrosive water, which completely spoiled it. Stanzieni, disgusted with the baseness of the act, would not restore it, preferring to leave it as a monument of Spagnoletto's meanness. Stanzieni died at Naples in 1868. He had a numerous school, and he left many notices of Neapolitan painters, which were used by Donizetti, Vite de Pittori Napoletani, &c.; Lanzi, Storia Pitteria, &c.

STARS, SHOOTING. [SHOOTING STARS, P. C. S.]

STATICE (from the Greek statif, intended to be used in the active sense, to 'stop,' so named from its supposed property of restraining hemorrhages), a genus of plants belonging to the family of compositae. The flowers are with 5-parted corolla, the calyx scarcely above, the capsules not bursting.

S. carduana has narrow oblong leaves on long petioles, sometimes more than a foot long. The flowers are on long stems on the margin. The scape is round, smooth, slightly scaly, and terminated by a panicule of numerous branches, which bear the flowers on the upper side only. The flowers are alternate, erect, mostly in pairs, but appear singly in consequence of one expanding before the other. The calyx is funnel-shaped, scarious, and pink at the edge, 5-angled, the angles ciliate, and ending in long sharp teeth. The petals are oblong, longer than the calyx, and of a bluish purple colour. This species is a native of North America, where it is called the Marsh Rosemary. The root is a very powerful astringent, and is used as an application in aphthae and similar affections of the mouth and fauces; it has been employed with success in cancerous ulcers.

S. Limonium, Sea Lavender, is a British species, and has much divided corymbose branches curved outwards; the ultimate subdivisions elongated with unilateral rather distant flowers, the flowers of the inflorescence less than half the length of the calyx, with a short pedicel and four ascending or intermediate teeth; the bracts obtuse, the outer ones large, the margins tinged with pink.

S. sphacelata has spathulate leaves narrowed into a broadly winged stalk; the calyx segments blunt, entire, and without intermediate teeth.

S. reticulata has spathulate leaves narrowed into a flat stalk, somewhat acuminate behind; the lower one provides a much divided bract, of which the lower are barbed; the calyx segments acute, denticulate. It is found in muddy salt marshes at Norfolk.

(Babington, Manual of British Botany; Lindley, Vegetable Kingdom.)

STATUTE (Scotland). It would be difficult to explain the character of the statute law of Scotland, the method in which it was sanctioned, or the constitution of the bodies by which it was passed. All the light that probably is to be obtained on the early history of the statute-law has lately been embodied by Mr. Campbell in his Historical and Critical analysis of the Scottish Statutes and Old Laws, published by the Record Commission. 'Whatever,' he says, 'may be the case in other countries, it is not easy in Scotland to distinguish the ancient legislative court or council of the sovereign from that which discharged the duty of counselling the king in judicial proceedings. The early lawyers, indeed, enacted statutes by the advice of the 'bishops, earls, thanes, and whole community,' or 'through the common counsel of the Kyng.' But during the reigns previous to Alexander III., we find the king also deciding causes in a similar assembly of magnates: while laws of the greatest importance, and affecting the interests of the whole country, were emitted by the king and his 'judges.' It is probable that the practice of the assembly, legislative or judicial, of the principal barons, though irregular, was in general an imitation of the parliament of England. But the introduction of the privilege of the southern districts of Scotland had been in a great measure partitioned among Norman adventurers, some of whom owed a double allegiance to the crown both of England and Scotland; and it was natural that the Scottish kings should borrow from the practices and opinions of the country with which they were earliest connected. A large proportion of the lowland population of Scotland were at the same time Saxon refugees from England. So early as the reign of David I. (1124) we begin to find that the municipal corporations had a voice in the ratification of the laws. 'The parliament,' says Mr. Innes, 'assembled by John Balliol at Scone, on the 9th of February, 1229, was probably the first of the national councils of Scotland which bore that name in the country at the time, although later historians have bestowed it freely on all assemblies of a legislative character. We have no reason to believe that any change in its constitution occasioned the change of term, which soon became in Scotland, as in England, the received designation of the general legislative council solemnly assembled. It was not till a few years later, on occasion of the dispute with the natives of the Hebrides, that the desire of the French king, procured the treaty to be ratified, not only by the prelates, earls, and barons, but by certain of the burghs of his kingdom. That treaty was finally ratified on the 29th day of July, 1237. At that time the seals of six burghs were then affixed to the deed, along with those of four bishops, four monasteries, four earls, and eleven barons. Notwithstanding this very formal ratification, however, it may be doubted, both from the peculiar phraseology of the deed itself, and from the silence of historians as to any meeting of a parliamentary nature in which it could have been voted, whether the parties stated as consenting, and especially whether representatives of those six burghs, were actually present as in a national assembly of parliament.'

The acts which were thus sanctioned—sometimes, perhaps, by the separate adhesion of the principal interests of the country, sometimes in assembles—were of a mixed character. Some were judgments in particular disputes, accompanied probably by the announcement of a principle on which such questions should thenceforth be decided; others were acts of executive authority; and others might be regarded as having the character of fixed and general laws. When these proceedings related to matters of private right, the recording instrument would be put into the hands of the party interested.

When the proceedings of the national council, says the authority already cited, 'related to matters of a more public nature, such as negotiations with foreign states, its earliest records were probably of a similar kind, and consisted of the speech or other declaration of the council that embodied the results of its deliberations. Perhaps the earliest instances of this kind that now remain are those important deeds of the reign of Alexander III., when, however, a more
artificial system must have been beginning to prevail. It would be still more interesting to ascertain the modes in which the more general ordinances and laws of the realm were enacted and recorded; but on this head the loss of many original documents appears to be irreparable. Judging, however, from the mutilated and imperfect transcripts of a later age, and from the analogy of the other states of Europe, it would appear that the more important and general statutes were framed into more capitulars, and incorporated into a writ, addressed, in the name of the king, to the chief ministers of the law in the different districts of the kingdom, requiring the publication and observance of them. The laws of the burghs are the ancestor of David I., as stated in the statutes of Alexander II., as found in the old manuscript compilations of lawyers, seem to be the fragments of various capitulars of this kind. The statutes of David I., `Assist Regis David,' are reported to be the oldest fragments of legislation in Scotland, and are partly, but not entirely, traceable to so early a period as the reign of the king with whose name they are associated. The burghal laws, `Leges Quatuor Burgorum,' constitute the oldest systematic collection of laws. They too may be referred to the reign of David, and though historians give him the credit of having planned the whole system of the municipal corporations, it is more likely that this code of laws was the work of the burgh denizens and residue which had gradually come into existence with the growing influence of the burghs. The coincidence between these early vestiges of Scottish legislation and the old law of England is remarkable. Both institutions in the burghs and in the technical phraseology is frequently used, which still belongs to the law and practice of England, but has long been disused in Scotland. Indeed, it is very clear that, before the attempt of Edward I. to reclaim the realm, there was no special legislation, no spirit between the two nations, and that Scotland generally followed or accompanied England in all her constitutional progress. There is still a more remarkable coincidence of institutions than that revealed by the declaration of James I., for the general code of the old laws of Scotland. It was, like the fragments mentioned above, attributed to David I., who had obtained the character of the Justiciar of Scotland; but it is undatable. In the thirteenth and seventeenth centuries it was very popular, as an undated early national code; but it was subsequently discovered to have many features in common with the compilation `De Legibus et Con- 
septudindibus Animis,' attributed to Ranulphe de Glanville, justi- 
ciar of England, and then it acquired the evil reputation of being a code prepared by Edward I., for the purpose of sub- 
jecting Scotland to the law of England. `Upon an accurate 
collation of the books,' says Mr. Innes, `it appears that the first four books of Glanvil contain in systematic arrangement, with some inconceivable exceptions, the same matter, almost in the same words, which the compiler of the `Regiwm' has put together, and that the character of the Roman law, has been only that of a compiler. Indeed, in the time of the Institutes of Justinian, all the barbarous laws of periods of bigotry or violence have ceased to be en- 
forceable. Since the Union of 1707, it has been considered, in conformity with the English doctrine, that an act passed by the British Parliament must stand, even if it appears to have generally happened that the full assembly only met on the first and the last days of a session: on the former the lords of the assembly were chosen; on the latter, the members of the house of commons were voted on, and sanctioned or rejected. The royal assent was given by touching the act with the sceptre; but some constitutional writers maintain that this was a mere court ceremony, and that an act which had passed the three estates became law without any sanction from the king. It became a principle which widely distinguished the legislation of Scotland from that of England, that in the former country statutes might come to be law by merely falling into desuetude. Of the statutes of the Scottish parliament, those only are now law which are said to be in viltro observantia. By this principle the statute law has silently modified. It was the charade to the chagrin of the Institute of Roman law, that the barbarous laws of periods of bigotry or violence have ceased to be en- 
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them to be enforced is to be found only in England. In many instances these acts have only been capable of enforcement in Scotland by reading, instead of English institutions, those of Scotland, which most nearly correspond with them—as, by subscription to newspapers, the 'Sailor's Weekly Record at Westminster.' The remedy for this evil appears to be, to incorporate with each act a clause stating the territorial extent of its application; and whenever it is intended that it shall apply to Scotland, to have clauses especially applicable to its enforcement in that part of the empire.

**STATUTE (IRELAND). [PARLIAMENT OF IRELAND, P.C.]**

**STATUTE OF FAUDS.** This name is applicable to any act which makes the question of fraud, or of the fraudulent character of a transaction, a matter of evidence, and is particularly applied to the 29 Car. II. c. 3, which is entitled 'The Statute of Frauds and Perjuries.' One object of the statute was to prevent disputes and frauds by requiring in many cases written evidence of an agreement. Before the passing of this statute many conveyances of land were made without any writing as evidence of the conveyance. An estate in fee-simple could be conveyed by livery of seisin, accompanied with proper words, and a use could also be declared by parol. No writing was necessary to convey any estate in possession, for such estate is technically said to lie in livery, but a revestiture could only be conveyed by deed. The statute of frauds declared that no estate of any interest not descended by generation in fee simple, of any interest not determined, of any interest not for a term for a term of years, or any uncertain interest in any lands or hereditaments, made by livery and seisin only, or by parol, and not put in writing and signed by the parties, &c., shall have the force of law. But the principal point to which the statute relates is the effect of deeds for more than three years, wherein the rent reserved shall be two-thirds of the full improved value of the thing demised, are excepted by the statute. Further, no lease, estates, or interest either of a term for a year, or of a term more, or of an estate by property, being by copyhold or customary interest, shall be assigned, granted, or surrendered, except by deed or note in writing. Another section of the statute provides that all declarations or creations of trusts by instruments signed in the presence of witnesses, or any having no predecessors, or any criminals, receivers, or any person, being copyhold or customary interest, shall be assigned, granted, or surrendered, except by deed or note in writing. Both these sections are repealed by the last Will's Act, 1 Vict. c. 26, which makes alterations in other provisions also of the Statute of Frauds.

**STATUTE MERCHANT. ACTON BURRELL, STATUTE OF, P.C. S. 22.**

**STEAM-VESSEL, SCREW.** While much has been done since the publication of the notices of screw-propellers under **Screw of Archimedes**, p. 111, and **Steam Vassar**, P. C., p. 610, in the practical application of such apparatus to steam-vessels, and results have been obtained which lead to the conclusion that this mode of propulsion is practicable upon a very large scale as well as in small vessels, and that it possesses some very important advantages over the use of paddle-wheels; the invention yet remains too experimental a state to justify any attempt to deal with it as a settled branch of science. Since the date of the articles referred to, in addition to vessels of more ordinary dimensions, the screw-propeller has been brought into use in the immense iron steam-ship now called the Great Britain, but which, while building, at Bristol, was sometimes referred to as the Mammoth, the dimensions of which, as given in the 'Ateneum' for 1846, p. 118, are 290 feet long and 50 feet broad in the widest part, drawing 16 feet. Its capacity is about 3000 tons, and the engines, consisting of four cylinders of 88 inches diameter and 72 inches stroke, are of 1000-horse power each. The Great Britain was launched, was fitted, on her completion in 1846, with a screw-propeller 164 feet in diameter, with six arms, mounted in the stern, and capable of being turned with great rapidity so as to allow the vessel to be steered in any direction almost immediately connected with the engines, and communicated its motion through an endless chain to a much smaller wheel fixed on the shaft, which constituted the axis of the propeller. The propeller was thus turned with a velocity exceeding that of the crank-axis in a ratio determined by the relative diameters of the larger and smaller chain-wheels. Thus mounted, and consequently the setting of the propeller was stepped on deck so as to be removable at pleasure, with wire rigging, and with every requisite for taking advantage of favourable winds, the Great Britain sailed from Liverpool on the afternoon of July 25th, 1846, on her first trans-Atlantic voyage, and reached New York on the afternoon of August 10th. After her fourth voyage (the second homeward trip), during which she was left for some time wholly dependant on the assistance of the screw-propeller, she was fitted with a new and much stronger propeller, weighing seven tons, of the same diameter as before, but consisting of only four arms or vanes; and she was at the same time fresh rigged, her number of masts being reduced to five, and the whole stepped upon the keelson. With these alterations, in an experimental trip made on the 30th of May, 1846, the Great Britain attained a speed of 11 knots, or about 13½ statute-miles per hour. *An important discussion upon screw-propellers, suggested by an account of a new steam-vessel called the Liverpool Screw, submitted to that body, was carried on during three days of the last week of the last session, and ended on February, 1844. In the course of this discussion, of which a full report was published in the 'Mechanics' Magazine,' vol. xl. pp. 291-299, it was remarked by Mr. Bennie that the speed of these vessels was at present very unequal, and that a ship which offered but little obstruction to the water, and yet acted upon it so as to exert full power in propulsion; and that a large portion of a complete screw having no useful effect, was lost in the direction of the blades. It was urged that the screws, being coplanar, or parallel, and the blades of the screw being coplanar or parallel, and the blades of the screw blades; thus doing away with the useless part of the surface. A perusal of the discussion alluded to will show that the engineers who took part in it were not quite agreed in their views of the action of such propellers, especially with reference to what is termed the 'slip,' by which appears to be meant the amount of motion absorbed by the propeller cutting its way through the water, instead of pushing the water forward with the speed of the ship. The amount of this slip might be deduced from the number of revolutions made by the screw, and the actual way made through the water. Without attempting to unravel this somewhat difficult question, upon the true comprehension of which the best shape, size, position, and velocity of the propellers must depend, we may observe with Mr. Farley that while the advantageous action of ordinary paddle-wheels is greatly impaired by variations in the degree of immersion, the submerged screw propeller, being wholly under water at all times, does not appear to be sensibly affected by any such alterations in the depth of immersion as are likely to take place in the roughest waves, as the greatest variations of draft are brought about by the lading of the vessel. When all circumstances were considered,' Mr. Farley observed, 'it might be safely concluded that vessels fitted with revolving submerged propellers would answer well for many of the regular voyages between the seas, in summer or winter; and, on an average, he thought that their passage would be performed at least as well (if not better) than those of any steam-vessels now in use; and with an economy of fuel, arising from such vessels making a more advantageous use of their sails, and less of their engine-power.' The absence of the ponderous paddle-wheels and paddle-boxes of an ordinary steamer greatly improves the sailing qualities of a screw-propelled vessel, while the arrangement of the machinery may be such as to render the vessel far more commodious, and, if desired, to leave the upper decks open from end to end. These, among other advantages, recommend this mode of propulsion for steam-frigates, and other vessels of war. The Princeton, an American steam-frigate, launched about the commencement of 1844, and mounted with Ericsson's transversal screw-propeller, affords a good example of the advantages of the invention as applied to masts and masts. This vessel, which, according to an account quoted in the 'Ateneum' for 1844, p. 205, from the 'New York Herald,' is of 700 tons burden and 250-horse power, has a submerged screw-propeller making 35 to 40 revolutions per minute, and is capable of making its way through the water at the rate of 14 miles per hour, or even somewhat more, is said to have beaten the Great Western in speed, although drawing at the time only 11½ feet.
time four feet more water, and exercising only two-thirds of her steam-power. The dimensions of the vessel are not given in the article quoted, but Mr. Brithwaite stated them, as follows: length over all, 165 feet long; beam, depth of hold 22 feet 6 inches, and draught of water 17 feet 6 inches. He also, if the report we have quoted be correct, stated the power of the engines as 400 indicated horse-power, and the velocity of the vessel as rather less than we have stated. In the absence of proof as to which statement is correct, we may observe that while Mr. Brithwaite's would indicate a very unusual and high proportion of power to tonnage, that of the the 'New York Herald' shows about the common proportion for fast vessels. The engines, according to Mr. Brithwaite, are of peculiar construction, having two steam cylinders or chambers, containing vibrating plates on the ends of the suspending pivots; these are coupled by connecting-rods to a main crank on the driving shaft, and the length of the first-mentioned cranks is so proportioned that their alternate vibrations shall give a rotary motion to the main crank, and thus act directly upon the propeller, without the intervention of chains or gearing. In a subsequent stage of the discussion this point was reverted to by Mr. Galloway, the advantage of turning the propeller by the direct action of the engines being, he said, generally acknowledged; indeed, he added, the method of driving it was nearly the only problem remaining for solution, and that difficulty would be overcome, he thought, naturally, from their vast advantage over paddle-wheels, in every respect but that, be universally adopted. Returning to the Princeton frigate, we may observe that it is evident, as stated in the report, that the novel principle of the English or the English paddle-wheels, as mounted would have the advantage over those of the usual construction in active service; for in that vessel the whole of the machinery, cranks, boilers, and furnaces, as well as the propeller itself, are below the water line, the top of the highest plates of the boilers being as much as four feet below, and therefore pretty secure against injury from shot, while, in the steam-frigates, and other steam-ships of the ordinary kind, the boilers and machinery, as well as the paddle-wheels themselves, are within destructive range. We may mention, although not directly affecting the use of the screw-propeller, that the Princeton is supplied with furnaces for burning anthracite, to avoid the production of smoke, and that she is ship-rigged, and so constructed that in favourable weather her screw may be unshipped, when she will sail well under canvas, a facility which can never be so perfectly attained with the use of paddle-wheels.

The Liverpool Screw, an account of which formed the basis of the discussion to which we have referred, is a small iron vessel, 46 feet long, 12 feet 6 inches beam, and drawing 9 feet 9 inches. This vessel was measured monthly with a screw of 3 feet 10 inches diameter, but it had been enlarged at three several times, and was, at the date of Mr. Grantham's account to one, 9 feet 4 inches diameter by 20 inches long, of wrought iron, and forming four short arms which united at 16 square feet, of which 13 only were immersed; a part of the propeller being constantly above the water. It was turned with a velocity of 25 revolutions per minute, by means of two high-pressure oscillating engines, working one crank upon the main driving shaft, without the intervention of gearing or bands; and the nominal power of the engines was 20 horses, though the effective power rarely exceeded 16½ horses. Though the proportions of this little vessel were not deemed favourable to a high speed, her length being only five times her beam, and her second diameter 38 feet, she was found, in a number of experiments, capable of being driven at a speed upon the Mersey, excepting the large sea-going vessels, and was proved to have a great superiority over other steamers in towing vessels at sea.

Many observers have stated that the usual position of the screw-propeller, immediately before the stern-post, does not appear either to be disadvantageous for the application of the propelling power, or to interfere with the action of the rudder. In this respect, it is to be observed, the effect of increasing the efficiency of the rudder. Under the impression however that a contrary result takes place, it was the subject of Maudslay's patent of 1845, to put the propeller behind the stern-post, in the position usually occupied by the rudder, and to employ two rudders, placed beneath the stern quartermaster, a little in advance of the propeller. An important use to which screw-propellers have already been applied in a few instances, and for which it is highly probable that they may be extensively adopted, is as a mere auxiliary power, for occasional use during calms and contrary winds. We are pleased to state that the new American packet-ship called the Massachusetts, which brings mail from Liverpool to New York, is a sailing vessel, fitted with conveniences of a very superior order, is provided with a small Ericsson propeller, 94 feet in diameter, and has towards the stern of the vessel a steam-engine which can be set to work when required, of 170 horse-power, capable of producing a speed of about 9 miles per hour in smooth water. The propeller is so constructed as to be raised out of the water when not in use. In sailing from Liverpool to America this vessel was kept in about 25 degrees of latitude, and between November 22 and November 18, 1845, gained from five to thirteen days as compared with five other ships which sailed either on the same or on the following day. The cost of the motive power in this vessel was about two-sevenths of her total cost, which was about $16,000. In a similar way an auxiliary screw-propeller is ordered to be fitted to the Ambigean frigate, which was launched at Woolwich in January, 1846, and which, though she is to be furnished with a screw of 16 feet diameter, and engines of 300 horse-power, which will render her quite efficient as a steam-vessel, has been built as a sailing ship, her construction having been commenced as long since as 1830.

We believe it will be generally approved by the British navy with her machinery entirely below the water-line, as in the American frigate Princeton.

Those desirous of investigating the history of screw-proellers, will find a full account of the invention in the report of the discussion which we have quoted, an ample chronological list of patents and inventions relating to the subject, from 1727, about which time a plan for propelling vessels up a river by means of screw was contrived in France, by M. Duquet, to the year 1843, in the 'Mechanics Magazine,' vol. xxxix, p. 292, with addenda on pp. 340 and 360 of the same volume.

STEENHAMMER, A genus of plants belonging to the natural order Boraginaceae. The calyx is divided into 5 deep segments. The corolla bell-shaped, with a short cylindrical tube with 5 minute protruberances in its throat. The stamens protrude beyond the throat, the filaments elongated.

S. maritima, the only British species, differs but little from Lithospermum except in habit. It has a procumbent branched stem, ovate, acute leaves, with rough, hard dots, glabrous, thin, and glabrous, having a taste resembling oysters. The nuts are smooth. The flowers in racemes and of a purplish blue colour.

(Baldwin's Manual of British Botany.)

STELLA, JACQUES, was born at Lyon, in 1506; his father, Francois Stella, who was also a painter, died when he was only nine years old. Notwithstanding the early age at which he lost both his parents, his father, Stella is said by other masters. At the age of twenty he went to Italy, and at Florence he was employed by the Grand-Duke Cosmo II. to execute the decorations which were designed for the celebration of the marriage of Ferdinand II. Stella made many designs and painted several pictures for the grand-duke, who gave him apartments and allowed him a similar pension to that which he gave to Callot the engraver. After living seven years in Florence, Stella went to Rome, in 1626, and contracted a friendship with Poussin, of whom he became also an imitator.

While in Rome he was, by some treachery or misunderstanding, thrown into prison, and while in confinement he assumed himself with drawing on the wall, in cipher, the figure of the Virgin with the infant Jesus in her arms. A report of the excellence of the drawing reached the Cardinals-Bishop of Bologna, who went to see it, and from that time a lighted lamp was suspended over it and the prisoners performed their devotions before it. In 1634 Stella returned by Venice and Milan to France, with the intention of visiting Spain. At Milan they offered for sale the pictures which he had made in Italy; but the public were unimpressed with his work, and he was induced to go to Spain, which he visited, and where he had been invited by the king. Cardinal Richelieu however succeeded in persuading him to Paris, and he procured him apartments in the Louvre, with the title of painter-in-ordinary and an annual pension of 1000 francs. In 1644 he was decorated with the cross of St. Michel and was elevated to the rank of principal painter to the king. He died at Paris in 1657.
Stella remained an imitator of the style of Poussin, but he did not go beyond the drawing and colouring of Poussin, and on the latter aspect he exaggerated the defect of Poussin: many of his pictures are very red. He excelled in pastoral pieces, and his father was a painter in both the French and English schools, and his interest in architecture which he showed in several of his greater works. He etched five plates himself, which are very scarce, namely, the Descent from the Cross; a Madonna; a Saint George; a genre piece with infants dancing; and a landscape, supposed to be of the Palace of the Grand-Duke of Tuscany, of the date 1621, which is very rare. Many woodcuts, apparently by P. Maupin, are marked 'Stella fecit,' but this alludes to the design, not the woodcut.

(Fabri, Entr'actes, etc.; D'Argenville, Vies des Peintres, etc.; R. Damoiseau, Peintres-Graffeurs Francais.)

STENOBAURUS, a crested and Enemies of the genus of Passerine birds which is distributed throughout the world.

STENELYTRA (Insects), the third family of heteromorphous Coleoptera in the arrangement of Latreille. Helops, Platella, Deroma, and Odhnera are examples. They are not of the next contribution to the group, in which their antennae are thickened at their extremities. They live under the bark of old trees, or on leaves and flowers.

STERNBERGIA (Bromeliaceae), the generic name for a small family of plants, the species of which are found in the Northern Hemisphere.

STERNOPTYX, a genus of small flies belonging to the order Salmonidae, though very different in aspect from salmon or trout. They have very elevated and much compressed bodies. They live in the warmer regions of the Atlantic Ocean.

STEWING is a process in cookery by which meat or vegetables are made fit for food by immersion in water at a high temperature for a considerable period of time. It differs from boiling by the temperature of the water not being allowed to reach 212° Fahr., and by being continued for a longer time. The effect is that of very thoroughly softening the substance used and the retort to a great degree of the favour of the meat or of the spices added. These ends are accomplished by employing vessels with very closely fitting lids. The material of which these vessels are made is commonly of copper, in which case, the owner of the vessel, or the German enamelled stewpans, so safe, and so well suited, from the extreme nicety of the composition, resembling earthenware or china, with which they are lined, to all delicate composition of copper, is to be kept very clean, and the tinning always perfect. If this is rubbed off acid and acetic liquid forms poisonous compounds, which produce serious and occasionally fatal effects.

When several stews or dishes of vegetables are made at the same time, a bain-marie, or water-bath, is the best apparatus.

This is a flat vessel containing boiling water: all the stewpans are put into the water, which is to be kept always very hot, but it must not boil; the effect of this is to keep everything warm without altering either the quantity or the quality, particularly the quantity.

Gentle stewing is incompatibly the best—the meat is more tender, and the soup better flavoured. By quick and strong boiling the volatile and finest parts of the ingredients are evaporated, and fly off with the steam, and the coarser parts are rendered soluble: so you lose the good and gain the bad. The full flavour of the ingredients can only be extracted by long and slow simmering; during which, take care not to prevent evaporation by covering the pot as closely as possible. (C. S.)

STICTA. (Lam.)

STIEGLITZ, CHRISTIAN LUDWIG, was born December 12th, 1766, at Leipzig, in which city both his grandparents and father were persons of station, the former, who died in 1794, his father, in 1800. Having been appointed to the office of proconsul. Surrounded at home with objects of art, for his father possessed both a collection of pictures and a cabinet of medals and minerals. Steiglitz inherited from them almost in his childhood those tastes which so amictiously cultivated throughout life, although they were altogether remote from his other studies and occupations. Though he was not a pupil of his father's, he formed a high taste in art, and in 1777, and in 1784 that of doctor of laws, on which latter occasion he produced his dissertation 'De Caesaris sui us Feudalis Germanicum in Germaniae negotiis sit.' In the same year he was made a member of the G. W. Society, and in 1776 he published 'Wardburg,' a poem in eight cantos, which appears to have attracted so little notice, that though bibliography has preserved its title, the production itself has obtained no permanent record in literary history. He also published some tales of romance and chivalry; but it was in a very different field from that of the poet or novelist that he gained his reputation and rendered essential service to a branch of literature to which he contributed a great part of his leisure. As a revisor of the works of his fellow-countrymen and an opponent of the nonsensical writers in it than of those who practise the art. It was in 1786 that he appeared, though then anonymously, as an architectural writer, with his 'Versuch über die Baukunst.'

The other method of conveying German Wissenschaften' several essays and minor treatises on various subjects relative to the aesthetics of architecture and decoration, one or two of which appear to have been also published in the latter year. In 1790 he was elected a member of the Rathskollegium, or Council of Leipzig, he first brought out his 'History of the Architecture of the Antients' ('Geschichte der Baukunst der Alteren'); and immediately afterwards engaged in a work of compilation, the 'Encyclopaedia of Civil Architecture,' in five volumes, the first of which appeared in 1792, the last in 1798. In the interim he brought out a work upon Modern Gardening, which came to a very successful conclusion, and a continuation of it was published 'Artistiche Blatter' (1800), a collection of papers on Decoration. In 1804 he began to publish, under the title of 'Zeichnungen aus der Schulen Baukunst,' a series of engravings, plans, and elevations, intended as select specimens of modern architecture; but though it was exceedingly well-received—for not only did it come to a second edition, but there was also a French one—the choice compromised both his judgment and taste, the majority of the specimens partaking of that feeble and inaptness manner which had just before prevailed in this country; and a great many of the subjects were taken from English publications—those, for instance, of Adam and Pater, which were reprinted in Germany, and among others such examples as the Trinity House, London, and the County Hall at Chelmsford. How he could reconcile them with his own theoretical principles is difficult to understand.

Whether it was owing to his being satisfied with what he had then done for architecture, or afterwards disinterested with his last work, some years elapsed before he again published anything on the subject, turning in the interim to studies more profoundly archæological; the fruits of which were an essay on 'Medals and Collections of Coins,' 1809, a treatise on the 'Fignerae employed by the Artists of Antiquity,' 1818, and 'Archæologia Unterthannen,' 1820. In the same year with the last-mentioned publication came out his excellent work on 'Ancient or Medieval German Architecture' (Alte-Deutsche Baukunst), which contributed not a little to direct attention to and inspire taste for medieval art and its monuments which has since struck root and grown up in Germany. His next work was his 'Geschichte der Baukunst,' a valuable compendium of the history of architecture from the very earliest period, and which appeared in five volumes, the first edition of which appeared in 1827, and the second, a greatly enlarged one, in 1837. Contrary to the opinion of Hirt [Harr. P. C. S.], Stieglitz has not, in his 'History of German Architecture,' derived its principles and characteristics from an original construction of stone, and not of timber or wooden framing. The list of his literary labours is further extended by 'De Enth. der Familie der Romanen ins Altertum,' 1806, and his 'Beiträge zur Geschichte der Ausbildung der Baukunst,' 2 vols., 1848; and it would be prodigiously increased were it possible to enumerate...
all the various articles which he contributed to the *Imeresia,* the *Kunstblatt,* and other journals; and to Ezech and Grüber's Encyclopedia. After having held the office of president of the Academy of Leopoldstadt and other appointments connected with the town government, Stiglits retired from public duties in 1830, though he retained the title and distinction of proconsul; and in 1834 the *Jubilee* or fifteen anniversaries of the church was celebrated by his townsmen, and a silver medal was struck and presented to him on that occasion. He died July 17th, 1836.

In Fürsten's *Bauzeitung* for 1888 there is a portrait of Sigismund accompanied by a full memoir of him, which we have made use of for this article.

**STIGLMAYER, JOHANN BAPTIST**, the late distinguished director of the Royal Brass-foundry of Munich, was born October 18, 1791, at Fürstenfeldbruck, a small market-town near Munich, where his father carried on the business of a blacksmith. At Fürstenfeldbruck is an old foundry called by Ludwig the Strong, of Bavaria, in atonement for the basty execution of his innocent wife Mary of Brabant, in 1280.

This foundry, which had undergone various changes, and had been at various times extensively decorated, was the school and academy of the barefooted blacksmith's son, though in his time it was a military stable for foals (Militär-föhnhof).

It contained stucco decorations by E. Asam, frescoes by Appiani, statues by Roman Boos, and other works of the last century. This building, as already observed, was Stiglmayer's academy, and also the site of the library and Museum of a book of the natural history, which, with a cactehism and prayer-book, constituted the whole library of his father. These woodcuts and the decorations of the foundry were diligently copied by Stiglmayer, who, with great industry and many unhappiness (he was unable to go daily for milk), at length ventured to introduce himself to the superintendent of the establishment, Herr Pfeiffer, who had heard was not only himself a draftsman, but possessed considerable skill in the art of engraving, and, embodied his talent in some regular elementary instruction in design. After this he was placed by his parents with a goldsmith at Munich, of the name of Streisal, and he attended in the evening the daily school (Försternacht), in which he obtained the first prize for industry and good conduct, amounting to 100 florins (8 guineas), by which he attracted the notice of M. Leprévier, the director of the Bavarian mint, who from this time took much notice of Stiglmayer, procured him admission into the academy in 1810, and became in a manner his patron. From the date of his admission into the academy, he pursued the regular course of study requisite for a statuary and sculptor, and at the same time practised seal and medal engraving. He was very successful in 1814 in a medal with Von Langer, the director of the Academy, on one side, and Moses making the water flow from the rock on the other. In 1816 he was appointed engraver of the mint, and he was sent in 1819, at the king's expense, to Italy to complete his studies.

It was in Rome that Stiglmayer's great patron, Ludwig, the third of Bavaria (then crown prince), became cognizant of his high abilities, and appears himself to have directed Stiglmayer's attention principally to metal-foundling, in preparation for his own great undertaking already projected by himself. In reference to this future occupation Stiglmayer repaired to Naples to witness the casting of the bronze colonnade of Charles I., to be directed by Francesco Righetti and his son Luigi, from the model by Canova; the Italian sculptor's reserve and jealousy however rendered Stiglmayer's journey in vain as regarded its principal object; he did not allow him to see the casting. But he was fully represented; after his return, he undertook the considerable trouble he obtained permission to erect a small, square, and, having procured the assistance of Beccati, an experienced founder, then to be found in few if any casters of that city, of Engald, and the casting of several works himself. The first wholly failed, but the second, a cast from Thorwaldsen's bust of Ludwig I., then crown prince, was completely successful, so much so, that Thorwaldsen, Paruoli, and other sculptors, to give him this additional authority, supplied him with some banditti who robbed him even of his sketch-books. He returned to Munich in 1822, but was at this time employed chiefly in his capacity as engraver for the mint, and on some unimportant works of sculpture for the new Sculpure Gallery or Glyptothek then in progress. To the models of this time belong that in commemoration of the marriage of the Queen of Prussia, for the minister Von Zeuner, and the historical monument of Queen Elisa. These busts were those of King Maximilian I. and the Queen Theresa, Count Döring, the ministers Baron Von Zeuner, and Lerchenfeld, Bishop Stuhler, and others.

In 1825, the year of his death, Stiglmayer had the great series of metal castings, and from this time he was exclusively employed in founding the numerous monumental works which have been executed for Ludowig I., the present King of Bavaria, some of which have the most extensive castings of modern times. In order to be as well prepared as possible for his arduous task previous to casting any great monument, he visited Berlin in 1824, to witness the casting of Ranck's statue of Biber, by Reiniger, who showed him everything in his power. Stiglmayer's great activity commenced with the reign of Ludowig I., in 1826, in the foundry established and afterwards much enlarged by the king, expressly for his own numerous undertakings in that important branch of art; and he left many, and the most considerable still unfinished, at his death. He was created in 1839 Knight of the Bavarian order of St. Michael.

The following is a brief summary of his labours—from his own designs—the monument to the Brazilian children Juri and Isabella, and the reclining figure of the Friable Von Mannclil, in the cemetery at Munich; the monument of Maximilian II., Elector of Bavaria, designed by Liebermann, to the statue of Otto, king of Greece, from his mother Theresa, queen of Bavaria, at Aibling; after Schwantaler—the twelve colossal fire-guarded statues of the ancestors of the King of Bavaria, ten of which were executed for the front of the imperial palace; and the status of General Bekker for his monument in Munich; the colossal monumental figures of Jean Paul in Bayreuth, Mozart in Salzburg, the Margrave Frederic of Brandenburg in Erlangen, and the Grand Duke Ludwig of Wurttemburg, and the gilt bronze pieces of table-service, with designs from the Nibelungen and Amelungsen, for the crown-prince of Bavaria: after Thorwaldsen—the statue of Schiller at Stuttgart, and the colossal monument of the Elector Maximilian I. of Bavaria, at Munich; and, after Ranck, the monument of King Maximilian I. of Bavaria, before the theatre at Munich.

He executed also the following architectural casts from models made in the foundry, chiefly from the designs of Von Klenze; the obelisk, 100 Bavarian foot high, in commemoration of the 30,000 Bavarians who fell in the Russian campaign of Napoleon in 1812; the bronze gates of the Glyptothek and the Walhalla; and the monumental column at Giebach; the interior pediments of the Walhalla, with the northern deities; the gilded candelabra in the new throne-room in Munich; the monument to the brave Oberst von Langer, with four allegorical figures; and the urn and the tomb of King Maximilian in the royal vaults (Fürstenburg) at Munich, after a design by the architect Ziemba. Besides the above works, which are completed, are the following works in progress: the large statue of Ludwig II., in the foundry; the monument of Stiglmayer's death;—the colossal statue of Goethe, for Frankfurt, after the model by Schwindtaler; and from the model of the same sculptor, the enormous colossal figure of Bavaria, nearly sixty feet high, to be placed before the Bavarian temple of Fame, or Ruhmshalle (now in progress in the suburb of Munich, and which will be completed in 1850). It is the largest statue in the world, measuring, with its pedestal, eighty feet; also, by Schwantaler, the monument of the late Grand-Duke of Baden, with a pedestal and four allegorical figures of the four circles of the dukedom; and the statues of the goddesses of the Arts and Sciences in the new building of the University of Munich; and casts from Teisserin's models of the statues of Ferdinand, king of Naples, for Naples, and of Bolivar, for Bolivia, in South America.

On Stiglmayer's death no one undertook the task on which the statue of Goethe was cast by his nephew and assistant Ferdinand Miller. Stiglmayer had suffered from illness two years previous to his death, and many supposed it owing to the untimely death of his friend Engald. He died of cancer in the stomach, which Breslaü, the king's physician, had previously declared to be the cause of his illness. (Kunstblatt, 1844; Soell, *Bildende Kunst in München.* )
STIL, JOHN, the son of William Still, of Grantham, in Lincolnshire, was born in 1643, and became a student of Christ's College, Cambridge, where he took his degree as Master of Arts. In 1670 he was appointed Lady Margaret's Professor in the mathematical and mechanical sciences in Suffolk and Yorkshire, and was successively Master of St. John's and Trinity Colleges. In 1588 he was chosen proctor of the corporation; and, in 1592, he was raised to the bishopric of Lincoln, and held till his death in 1607. Bishop Still is said by Fuller to have been 'one of a venerable presence, no less famous for a preacher than a disputant. He left a large fortune, chiefly derived from leading disputes, and the judicious composition of sermons on the sea. The historians of the drama converse in believing he has been, in his youth, the author of a coarse but humorous play, which, till the recent discovery of Ralph Royster Doyster, was held to be the earliest extant work known in England by the name of a comedy. It is called, 'A right pithy, pleasant, and merie Comedie, intytuled, Grammer Gurnet's Needle: played on stage not long ago, in Christ's College in Cambridge.' Made by Mr. S., Master of Art, 1576. 'Gammer Gurton's Needle' is in Hawkins's 'Origins of the English Drama,' and in the second volume of Dodson's 'Mesters.'

STIPA, a genus of grasses belonging to the tribe Stipeae. It has stalked flowers, the pale coriaceous, the inner entire. S. pumila, the only British species, has a very long twisted feathery awn, with a glorious base. It is a very beautiful plant on paper, or our gardens. Found on rocks in Long Seadae near Kendal. (Babington. Manual of British Botany.)

STOCKADE, in Fortification, is the name given to a wall constructed a certain generality by piling together the exposed trunks of trees, or rough piles of timber, so as to inclose an area which is to be defended. The trunks or piles are planted close together; and at intervals of three feet from one another loopholes are cut through them, or notches a few inches long are cut down, vertically, from the top, through which the defenders may direct a fire of musketry on the assailants. An inclosure of timber so planted is sometimes called a Pullaska, from a name which is said to have been given by the Poles when they first entered Europe, to their field-redoubts or small entrenched camps.

Stockades are still frequently constructed as temporary fortifications in countries which abound with timber, as in North America and the East Indies; and, among uncivilized nations, as the Patagonians of Patagonia, are the only kinds of fortification which have been executed. They were also, in general, the means employed by ancient armies while besieging towns, to protect themselves or to prevent the escape of the garrison. The walls with which the Peloponnesians surrounded the besieged thebes and the agis had on one of those walls were stockades of timbers, and palisades planted closer together in a double line with a certain interval between the lines (Theophrastus, ii. 76); and the fortresses of the Drile, a people of Habas, which are on the Eastern Sea, are described by Xenophon (Anab. ii. 2) as strong palisades, with a space between the state inclosure and embankment, on the latter of which were palisades and wooden towers. The description of the Pahn, or Hippahs, of New Zealand, which is given in the accounts of Captain Cook's voyages, would nearly serve for the stockades within which the natives of that country very recently resisted the assault of a British force. It is stated that the works consisted of trunks of trees planted close together, with a small inclination towards the interior space; and that at intervals from one another, particularly at the angles of the works, there were loopholes for the musketry of men who had mounted behind them. As these loopholes were covered with a slanting of the top of the wall, so that the defenders were able to see the ground at the foot of the wall while they were concealed from the view of the enemy. In the interior there was usually a high mound, so that in cases of attack or inspection, the pales and palisades, were deposited. The pales are generally on the summits of heights, and they are sometimes strengthened by outworks of a similar nature.

STO Fac for BUILDING. In the United States of North America, during a war, stockades consisting of roughly-hewn trunks of trees planted close together in upright positions and pierced with loopholes for musketry, are very frequently constructed for the purpose of protection from the fire of the enemy, and at each of the angles of the inclosure a sort of blockhouse, serving as a bastion to flank the stockade, is constructed with very thick logs of timber placed horizontally.

These block-houses are sometimes formed with an upper story, the angles of which project over the sides of the lower one, so that by loop-holes in the projecting part of the floor a fire of musketry may be made upon the enemy when at the foot of the wall.

STOCKINGS, [WEAVING, F. C.] STONE for BUILDING. The durability of stone may be examined in several ways, and results of much importance to this in the area of shingles is obtained by some latter investigations at the foot of the purpose for determining on a proper stone with which to construct the New Houses of Parliament. In their natural repositories the surfaces of rocks are exposed to the action of the atmosphere and mechanical agencies connected with the atmosphere and dependent on the climate. Rocks which are composed in any considerable degree of carbonate of lime or carbonate of magnesia— or which contain minerals into whose composition silicates of iron or of the acid silicates are transferred to buildings in great towns, the air, loaded with sulphurous and other acrid vapours, is still less favourable to their preservation.

Not only the freely consolidated chalky rocks (like that of Mortemer), but the more solid Cotyles of Bath and Portland, have failed to withstand the injurious action of the atmosphere; nor is even the finest mountain limestone of Derbyshire or half-crystallized and half-cordifoliate marble of Plymouth capable of preserving its edges and angles from slow decay and efflorescence, even in a country so dry as that of the Cotyles or the comparatively low and tranquil regions of Devonshire. Even the purest crystallized marbles of Attica or Carrara, which may endure in the sunny regions of their birth, cannot be kept without injury to the moist and variable climate of Britain.

If, desiring to find a perfectly durable limestone, we turn our attention to other classes of rocks, we find other causes of decay equally influential on them, and a large proportion of these is the class of sandstones which comprises every degree of bad quality, but scarcely the highest degree of good—the imperceptibly decaying nullite gneiss of the Drudillar hills at Borrowbridge. When we consult the map, we are enabled to trace the original出产 to which the architectural beauties of Carlisle, Chester, and Coventry have been unfortunately trusted. Granite scarcely merits universally, nor even generally, the reputation of a very durable stone in Britain. Some of the Cornish and Devonian granite is of little permanence, much of that in Cumberland and the island of Arran is quite perishable, nor is all the stone of Killiney, near Dublin, free from the same reproach.

The decay of granite is usually ascribable to the unequal action of the atmosphere on its dissimilar and unequally resisting ingredients. The felspar often decays through the chemical action on the surface, and the quartz at the bottom of the rock, and the same may be said of the layers of granite and slate which alternate as cold wet and dry, alternate wetness and dryness, sunshine and shade, complete the disintegration. Similar remarks apply to many sandstones, for these often contain disintethrown felspar, granitic, and metallic, more or less mingled with the quartz, which is compacted with the quartz and mica of granite. The arenaceous rocks however yield with too much facility to the hygroscopic and other changes of the atmosphere, and except we can obtain almost pure quartz sandstones with almost confluent grains we cannot be confident of their durability. Now, such sandstones, like the harder granites, are unfitted for architecture, however useful for walls, paving, and other rough purposes.

STONE for BUILDING must in general be freestone firm enough to sustain great pressure, and yet so aggregated as to admit of easy working from facility by ordinary tools, and of receiving correct surfaces in any direction. It must in general yield masses of great dimensions. Its colour is of consequence to the architect, who is necessarily attentive to this element of effect; and the colour which belongs to the stone is very often, indeed generally, modified in buildings by the growth of lichen, the access of moisture, and the change of oxidation of the contained iron. By so many considerations, and the above limitations, it is evident that, in very few samples can be really placed in competition.

In the great variety of limestones and sandstones which are adapted for building purposes, we remark, by the aid of the microscope, the difference in the constitution of molecular aggregation: mixtures of grains; segregated concritions of grains; and compacted crystallizations.

To give an idea of the applicability of this classification, we
may shortly review a small series of examples of limestones arranged in a geological sequence. None are mentioned except such as have been tolerably well exposed. The
which are not really freestone or which have not been found
are inclosed in parentheses.

**Geological spec.**

**Sandstones.**

**Callozoic.**

Sarsen stone used in Sodbury. A mixed mass. It hardens on the surface by exposure.

**Mesozoic.**

(The freestone of Sodbury; a mixed mass. It has decayed in the churches of Sodbury.)

The 'calcaeous grit,' as it is called, of Yorkshire. It is a mixed mass (with little or no carbonate of lime). It is used at Duncombe Park; hardens by exposure.

The 'Kelloway' rock of Yorkshire: a soft mixed mass, very slightly cemented, hardens by exposure. Durable in the vicinity of Hackness.

The ferruginous sandstone of the inferior oolite: a mixed mass; is much used in the Midland Counties, and is often found in old churches well preserved, e. g. Northamptonshire.

The new red-sandstone of Penrith, mixed, durable in the old Castle; Giant's grave &c. (Other specimens of finer grain are among the worst stones of the kingdom.) A light coloured sort, called 'Keeper,' quarried near the Mavern Hills, is durable.

**Paleozoic.**

(Few of the sandstones of the coal-formation are of much durability, though many are of great beauty.) In the lowest part of the coal strata are good firm, rather coarse-grained, mixtures, as near Leeds: and below these the well known millstone-grit, the base of the northern coal-fields. This stone was used by the Britons and Romans in the north of England. In the natural rocks of Brin- ham, the Devil's Arrows of Borrowbridge, and the abbeys of Kirkstall and Fountains, it has not well resisted the atmosphere; but its decay is slow.

The magnesium limestone, a crystallized mass, varies in its compactness. It varies also in texture, from a confused aggregation of crystallized grains, to a small cellular texture, the walls of the cells being composed of small crystals; and finally to a largely cellular mass, the interstices of the cells being either compactly crystallized or filled with a soft earthy mass. In fine examples of this stone, as those of Mansfield, Boleover, Anston, Roche, and Huddersfield, the chemical constitution is nearly the same (one atom of carbonate of lime to one atom of carbonate of magnesia), and it is in the mode of aggregation that we are to seek the explanation of the very superior durability of these to nearly all the other magnesian limestones.

The thick beds of the mountain-limestone are often a mix for building, but seldom very tractable in ornamental work, except when the marly-seam area adopted or imitated. It is one of the characteristic limestones of limestones, though, generally only a mixture of grains. The fragment of the limestone is generally durable, but particular cases of failure occur. Stones of nearly corresponding age and of great durability have been much quarried near Barnard Castle and Bowes.

In considering even the few cases here adduced, we find mixed, concretionary, and crystalline textures, some of which are durable, others perishing. Mixtures of very similar or very dissimilar parts, as millstone-grit; concretions which have earthy textures in their interstices, as some oolitic limestone; crystallizations which do not produce compactness, in some magnesian limestones; and particularly in the sandstones mixtures, as the Sarsen sandstone, the Craigleith sandstone, and some mountain-limestones; concretions of adherent globules, as the oolite of Kettlet; concretions of globules cemented by sparry interstices, as the oolite of Aneur; and crystallizations with uniformly adherent grains, as in the magnesian limestone of Bolsover,—these appear to be durable. The microscope may determine in many cases between one class and the other. Additional evidence may be obtained by exposing masses of stone to frost and sunshine, rain and wind, to imbibition of salts which expand in crystallisation, and to mechanical pressure. And there remains one further class of evidence more important than all the rest—and that is experience. By observing how the various sandstones and limestone stones have behaved in castles and abbeys, and churches, we may attain with the highest probability a correct estimate of their intrinsic durability.

The commissioners (Mr. Barry, Sir H. De la Beche, and Dr. W. Smith) who reported on the choice of stone for the construction of the New Houses of Parliament, have neglected none of these considerations, and their report, certainly the most valuable document which has ever appeared on this subject, embodies a great mass of valuable statistical information on the most famous quarries; accurate notices of the most remarkable buildings which were constructed from them; and chemical analyses and mechanical experiments on the stone. The strength of several sorts of stone, as measured by the weight necessary to be applied for breaking and crushing them, appears below:

<table>
<thead>
<tr>
<th>Name of Stone</th>
<th>Resistance to Fracture</th>
<th>Resistance to Crushing</th>
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<tr>
<td>Sandstones</td>
<td>50</td>
<td>111</td>
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The asterisk is placed to two numbers. One refers to the sandstone of Darley Dale, which bore the greatest weight previous to the first fracture, and the other to the Kettlet rag, which bore the greatest weight before crushing (this can hardly be an average specimen of the stone). Of sixteen specimens selected, the stone most absorbent of water was...
proved to be the Bath colite from Box; that most in-
herited by Brard's artificial process of disintegration was the
Barnack stone: and that which was most easily crushed was
there may be of service in the description of the stone. Stanes were
least absorbent, magnesian limestones least disintegrate-
magnesian limestones (as that of Bolsover, finally recommended
were almost as little porous. (Report of the Commiss-
uncommonly decay by disintegration at the surface, losing grain by grain in proportion to time and ex-
posure. But they sometimes suffer a singular change, as if both birth; and that part of the natural enveloping crust is thus
formed, as at Stonehenge, where the interior is soft, but the
exterterior hard. This process appears to render such a stone
durable. But if carried further, so as to produce a new tex-
ture of the surface, the external shell separates from the in-
terior mass, decompounds and falls off, leaving a rough soft
inner core. This happens even to moulded surfaces like those
of balusters. Stones composed of parts unequally mixed suffer
unequal waste in different parts. Shells, corals, concretions,
and crystallized masses, thus appear prominent from early
limestones, and indicate the general fact that, in proportion
the force of molecular aggregation in the stone, is the re-
sulting durability of the stone.
Again, the circumstances under which a stone is exposed in
a building influence its conservation. It is not the amount but
the kind of exposure which governs its decay. The southern
and eastern sides of the Art of Painting monoliths from
southern and eastern resist. Prominent cornices often are perfect,
while below them the mouldings are reduced to shreds.
The drip-mouldings remains and is even hardened, while the parts
which it has impregnated and protected have been moulded away.
Moreover, the Incised surface has actually occurred to the observation of the writer in the
space of only a few years. In fact since 1839 the same
pieces of magnesian limestone remain perfect in the drip-
mouldings, while the notice of the whole ornamented
surface below is ruinously decayed.
STONE, NICHOLAS, master mason to Charles I., was
born at Woodbury, near Exeter, in 1586. He lived three years
in London with one Isaac Jones, his master, and then went
to Holland, where he worked for Peter de Reyser,
whose daughter he married. He returned to England about
1614, and was for many years chiefly employed in making
monuments for the nobility and gentry. In 1619, he was
appointed master mason for building the new Banqueting
House of Whitehall, on which he was engaged two years at
4 shillings and 10 pence per day; and in 1626, at the com-
mencement of which work, he obtained a copy of the
master masons of Windsor Castle. The patent is in
Hymer's 'Fodera,' vol. xvii. p. 675. The history of Stone's works
is fully recorded by himself in a pocket-book, which was in
the possession of Hawkins, and now in the possession of
Vereker, from whom he obtained a copy. This pocket-book contained a full account of
the various monuments he had executed, with the sums of
money he received for them, and the names of the persons
for whom they were constructed.
According to this book, Stone erected in 1624 a monument
to the Earl of Ormonde, at Kilkenny, for which he received
400l. He received in the following year 600l. for a monument
to Henry Howard, earl of Northampton, erected in Dover
Castle. For a tomb made for lady Harrington, Countess of
Bedford, 1616, he bargained for 1020l., besides the charges
for carriage and iron and setting up. This year he went to
Scotland, and he gives the following account of his trans-
actions there:—July, 1616, was I sent to Scotland, where I
undertook to do work in the King's Chapple and for the
King's Closest, and the organ, so much as came to 430l. of
gainson works, the which I performed and had my money
well paid, and 50l. was given to drink, whereof I had 20l.
given me by the king's command. He mentions drink-
money on other occasions. Stone made several monuments for
Charles I., and received 60l. for each one, and another 16l. to Spencer, the
post, for which the Countess of Dorset paid him 40l.
In 1625, he made for the old Exchange of London four
statues—Edward V., Richard III., Henry VII., and Queen
Elizabeth; and was paid 400l. for such works. For the three kings he received 25l. each, for the queen,
30l.; 25l. appears to have been Stone's ordinary charge for
a statue, including the pedestal.

Stone received altogether nearly 12,000l. for the various
monuments erected by him. The various sums for monu-
ments noted in his pocket-book, amount altogether, ac-
cording to his book, to 12,300l. Besides this, he acquired his information concerning Stone's family, to 10,882l.
Walpole has given a list of the principal monuments, and
mentions some architectural works by Stone. He died
August 24, 1645, and was buried in the church of the
Martin's Church, where there is a slab to his memory with an inscrip-
tion and his profile. His wife and his son Nicholas are
buried in the same grave: they both died in the same year a few months after his death. Stone had three sons, Henry,
Nicholas, and John.

Henry Stone, known as Old Stone, probably because he
was the eldest, was a stonemason and painter, but he was chiefly
engaged in painting monuments, and studied in Italy and the Netherlands,
and made many excellent copies of celebrated Italian and Flem-
ishing pictures: there is a large copy at Hampton Court of the
celebrated picture, by Titian, of the Comaro Family, now in
the possession of the Duke of Northumberland. He lived in
Long Acre in the same house that was his father's, which he
rented of the crown for 10l. per annum. He died in 1653,
and was buried near his father; and the following inscription
in his memory was placed in the church by his brother John:

"To the memory of Henry Stone of Long Acre, painter and
statuary, who, having passed the greatest part of thirty-seven
years in Holland, France, and Italy, achieved a fair renown
for his excellence in arts and letters, and in the decline of his
life on the 24th day of August, A.D. 1653, and lyeth buried
near the pulpit in this church." Here follows some laudatory
verses. Old Stone wrote a book, entitled the 'Third Part of
the Art of Painting,' written in Latin, and sent to one
who saw this book, was uncertain whether the two former
parts were composed by Stone, or by some other author.

Nicholas Stone, the second son, who was a stonemason,
also studied abroad and made excellent copies of celeb-
rated works. Mr. Bird, the stonemason, says Walpole, had the
't Lascooun' and Bernini's 'Apollo and Daphne' in	terra-cotta
duly authenticated.
Him. He returned to England in 1642, and died in the
same year as his father, as noticed above. Venetius saw a
book of drawings by him of many buildings in Italy.

John Stone, the youngest, was also a stonemason, though he
was originally designed for the church, and was educated at
Oxford. In the civil war he entered the King's army, and
narrowly escaped being taken. He concealed himself for a
year in his father's house without his father's knowledge, and
at length contrived to escape to France, where he probably
took to the arts, as he was afterwards, noticed, and in the
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parts were composed by Stone, or by some other author.
STOWELL, WILLIAM SCOTT, BARON, was the elder brother of Lord Chancellor Eldon, and the eldest son of Mr. William Scott, coiffleur, of Newcastle, by his second wife, Jane, daughter of Mr. Henry Atkinson, who was of the same profession. [Exon, Earl of C.S.] He was born on the 17th of October, 1748 (O.S.) at Heworth, a village on the Tyne, about three miles below Newcas-

tle, and a considerable distance from Durham, to which his mother had been born a few days before, in the apprehension excited by the advance of the Scotch rebel army after the battle of Prestonpans. Egress in any common way being imprac-
tical, he was smuggled away, disguised to be a sort of basket over the town wall, which ran along the quay, separating Mr. Scott’s house in Love Lane from the river, where a boat was in readiness to receive him. At Heworth she and her sister, Jane, and a daughter, who was named Barbara and died in infancy.

William was educated with his two younger brothers, Henry and John, at the Royal Grammar-school of Newcastle, under the Reverend Hugh Moises. Moises is said to have been principally instrumental in getting both William and John

sent to college. William entered the University of Oxford in February, 1761, standing for and obtaining a scholarship at Corpus Christi College; but he had not long continued there when he

was told that he was required to go home. It is remarkable that for his eligibility on this occasion likewise he was again indebted to the accident of his being a native of Durham. He was now also elected by the same society a College tutor in the same capacity previously occupied by Dr. Scott. William (afterwards Sir William) Jones, who had recently left Oxford for the metropolis. In 1767 he took his master’s degree; and in May, 1772, he proceeded B.C.L., having been elected by this society in the same capacity as an advocate at Doctors’ Commons. He had already, with a view to the study of the law, entered himself at the Middle Temple, in June, 1762. He was detained at the University however a few years longer than he otherwise would have been by being elected in 1774 by the members of convocation after a contest, to the office of Camden Reader of Antient History. The lectures which he delivered in this capacity attracted crowded audiences, and brought him into high and wide reputation. It is said that they still exist in manuscript.

At last, in 1778, he retired from the office of College tutor; but he still continued to reside in Oxford till the following year, when he had taken his degree of D.C.L., which he did in 1770. On this occasion, in the University church, he went out grand compourner, which meant that he paid the higher fees ex-

pected of members of the degree. He had saved money from his income as Fellow, and his constantly increasing receipts during the twelve years that he held the office of College tutor; but it is to be remembered that he also had inherited a considerable property, and that he was one of the richest men in Oxford, who died in 1776. It was probably the independence to which he was thus raised that determined him to resign his employment as a college tutor; but it appears that old Mr. Scott’s son was not the only one who, according to Mr. Twiss, was to be by Mr. Twiss in the first and second editions of his Life of Lord Eldon. He left somewhat less than 20,000l.

He now entered at Doctors’ Commons, and passed another year partly in Oxford, partly in London, the rule being that no one shall practise as an advocate till the expiry of that space of time after his admission, which according is called his year of silence. Dr. Scott was called to the bar in February, 1780. He was admitted into the Faculty of Advocates at Doctors’ Commons, according to Mr. Surtees in one place in November, 1779, in another place not till the spring of 1780 (Sketch, pp. 36 and 81). So early however as December 1777 he had been elected a member of the famous Literary Club, having been mainly indebted for that distinction to the favour of Dr. Johnson, to whom he had been introduced in University College by their common friend Chalmers. At this time he was at the University of Edinburgh. He soon became a favourite with Johnson, whom he had

accompanied from Newcastle to Edinburgh, when the latter set out on his tour to the Hebrides, in the autumn of 1777. With the introduction of Johnson’s' qualities, Scott rapidly made his way to distinction in the most intellectual society of the English capital.

His talents and learning, and the reputation he had brought from the University, brought him a large practice in his profession from his first entrance upon it. And his success as an Advocate in no long time led to promotion. In 1783 he was appointed to the office of Registrar of the Court of Faculties. In 1788 the Bishop of London appointed him Judge of the Consistory Court; and the Archbishop of Canterbury, his Vicar-General, or Official Principal. In the same year he was made Advocates-General, and knighted, and was also nominated a Privy Councillor. In 1790 he was nominated by the archbishop Master of the Faculties. Fi-

nally, in 1798, he was made Judge of the High Court of Admiralty.

Meanwhile, after having in 1780 been disappointed in his expectation of being sent into parliament as representative of the University of Oxford, and having been unseated on a motion in 1764, when he had been returned for Dover, he had been made a second time returned for that borough, in 1780, through the influence of ministers with the patron, the Earl of Radnor. He was again returned for Dover to the next parliament, which met in 1786. At last in March, 1801, on a vacancy occurring by the retirement
of Francis Pag, Esq., he obtained the object of his early ambition by being elected member for his University; and that seat he retained as long as he continued a commoner.

The manner in which this object was first secured, and by numbers of works which have been raised to the perusal in 1805; but some unexplained court intrigue interfered, and he was not ennobled till the 25th of July, 1821, when he was created Baron Stowell, of Stowell-park, in the county of Suffolk, by the late Lord Melbourne, in the ninety-second year of his age. For the two last years of his life he was reduced to a state of mental imbecility; and he died at his seat of Early Court, Berks, after an illness of a few days, on the afternoon of Thursday, the 25th of October, 1836, in his ninety-second year. He had been twice married; first, in April, 1811, to Anna Maria, eldest daughter and co-heiress of John Bagnall, of Early Court, in the county of Berks, Esq., who died in September, 1811, and the 9th of April, 1812, to Louisa Katherine, Marchioness Dowager of Sligo (widow of the first Marquis and daughter of Earl Howe), his acquaintance with whom had originated, singularly enough, in the circumstance of his having preceded in the preceding December at the Admiralty Sessions at the Old Bailey, on the trial of her son, the late Lord Sligo, for inveigling some seamen from one of the king's ships to serve on board his yacht (for which he was sentenced to pay a fine of 500l., and to be imprisoned four months in Newgate). This last proved a very unsatisfactory connection; but the lady died in August, 1817. By his first wife Lord Stowell, besides a daughter who died in infancy, had two sons, Sir J. G. and Lord Stowell, both of whom died in infancy. Secondly, of the late Viscount Sidmouth, a son, William, who died at the age of forty-two, about two months before the death of his father, was born, is the highest English authority in his own department of the law, including both ecclesiastical law and the law of nations, if not the highest of all authorities upon the particular questions which he had occasion to consider and decide; for, having produced no complete treatise upon either of the branches of jurisprudence which he administered, he must be distinguished from the great text-writers, between whom and him no comparison is properly admissible. His judgments in the court of admiralty have been reported with precision and carefulness by Lady Haggard and Phillimore; those delivered by him in the Court of Admiralty, in an equally superior manner, and, in part, with the advantages of his own revision, by Drs. Robinson, Edwards, Dideon, and Haggard. Their characteristics are the most complete mastery of all the learning of his subject, great comprehensiveness of view, a penetrating sagacity in the disentanglement of the essential points and governing principle of a case from the confusion and sometimes apparent contradiction of details and accessory circumstances, a remarkable faculty of luminous and striking illustration, and all this combined and set off with a diction graceful and elegantly expressive, though occasionally somewhat diffuse and rhetorical. Some of Lord Stowell's judgments may be called almost revelations of the law, being exposures of large and intricate questions which had been long the subject of much discussion, but which he has completely cleared up and set at rest.

As a politician this distinguished lawyer was, like his brother, Lord Eldon, an uncompromising Conservative, shrinking from all change as only the beginning of universal ruin. Except, however, by giving his steady vote in support of his party and his principles, he very rarely took part in the proceedings of either House of parliament. During the first six years that he sat in the House of Commons, he only spoke once; of some two or three displays which he afterwards made, a speech of three hours' length, which he delivered on the 7th of April, 1802, on moving for leave to bring in a bill for amending the statute of 21st of Henry VIII., respecting the non-residence of the clergy, was the most memorable. He was also instrumental, however, in carrying through the House several other measures having a reference to the established church, of which he was the supporter on all occasions, considering himself indeed as a sort of representative of the clergy, both in his quality of member for the University of Oxford, and from his office as an ecclesiastical judge.

STROPHIOTES, a genus of endogenous plants belonging to the natural order Hydrocharidaceae. It has a 3-parted calyx and 3 petals. The male flower has 12 or more stamens surrounding the ovary. The plant is a small to medium-sized aquatic plant, with floating leaves and flowers. The fruit is a capsule, containing numerous seeds.

STREPTOCYCLIS, a Water-soldier, has sword-shaped triangular leaves and a rosette of floating leaves. The plant grows in mud, and sends out rigid leaves like those of an aloe. The stalk is compressed, 5 or 6 inches high, with two leaves near its summit. The flower is white and delicate. It is a very ornamental aquatic plant, and is found in ditches in the east of England. It remains under water during the greater part of the year, but raises itself to the surface on special occasions during the season for fortifying the seeds.

STREPTOSPERMA, a very extraordinary order of insects, remarkable for having the anterior wings transformed into a pair of short, slender, comforted appendages, whilst the posterior are very large and fold in the manner of a fan. The mouth is armed with two slender acute jaws and two pointed palpi. The tarsi are 2- or 4-jointed. The larva is vermiform and has no feet. The pupae are inactive. They are all very small creatures, the largest not so long as a quarter of an inch thick. The larvae live on leaves of grasses and mosses; the perfect insects are very short-lived, but very active.

These insects are the Rhipiptera of Laënnec, the Diptera Rhipiptera of Wernicke. Their systematic position has been much debated.

They were first observed by Mr. Kirby, who gives the following account of his discovery:—"Observing scars-like impressions on animal infesting the abdomen of various Andreae, he attempted to remove one, and to his surprise drew from the body of the bee a white fleshy larva a quarter of an inch long, the head of which he had mistaken for an ear. 'How the animal receives its nourishment after the removal of its head is a singular creature. 'When I had examined the head under a strong magnifier, I could not discover any mouth or proboscis with which it might perforate the corneous covering of the abdomen, and so support itself by suction; on the under side of the head, at its juncture with the body, there was a concavity; but I could observe nothing in this but a uniform unbroken surface. As the body of the animal is inserted in the body of the bee, does that part receive its nutrition from it by absorption? After I had examined one specimen, I attempted to extract a second; and the reader may imagine how greatly my astonishment was increased when, after I had drawn it out a little way, I saw its laevity of form and the fibres of the antennae and antenna consisting of two branches, break forth and move itself briskly from side to side. It looked like a little loop of darkness just emerging from the infernal regions. I was impatient to become master of its habits, and the insect, having been made a species of the genus, whose very class seemed dubious. ' (Monographia Apicis Angllicae, vol. ii. p. 111.)" 

Stylurus and Xeno are the genera of this order. For full information consult the writings of Kirby, Curtis, and Westwood.

STIGMOCETHALUS, a genus of fossil Brachiopoda from the Devonian strata of Plymouth, the Eifel, &c. (De- rivation).

STROBILITES, a genus of fossil fruits from the Cretaceous and Oolitic strata of England. (Lindley.)

STROMATOPORA, a fossil genus of corals from the Silurian and Devonian strata. (Goldfuss.)

STROMBODES, a fossil genus of corals from the Silurian, Devonian, and Carboniferous limestones. (Schinz.)

STROPHODUS, a genus of fossil fishes, including many species from the Oolitic and Cretaceous strata of England. (Agassiz.)

STUERBOUT, DIERICK, commonly called DIRK VAN HAARLEM, was born at Haarlem, in the early part of the fifteenth century. He is perhaps the oldest of the Dutch painters, and one of the best of the early masters. The two large works by him in the Royal collection at the Hague are wonderful works for their time, and, independent
of their age, are two of the most interesting pictures in the European collections. They were at one time attributed to Mengs, whose works they somewhat resemble; their history is well known, and their making is mentioned in some Ms. Annals and Antiquities of Louvain discovered by M. de Bast. The pictures were preserved at Louvain until 1827. They were bought by the Duke of Beaufort, and placed him in the catalogue of the gallery of the King of Holland, the first and second pictures of the Emperor Otho and the Empress Mary. Their subject is from a story of the old chronicles of Louvain, called the Galerie des Vaisseaux. The event took place in 1265. The Emperor Otho III., on his return from a journey to Rome, was condemned at Modena one of his courtiers, an Italian count, to death, in consequence of an accusation from the empress (Eliane de Luid), that he had attempted her honour. His count was beheaded, but immediately afterwards his widow, with his head on one arm and a red-hot iron which she holds with impunity in her other hand (an infallible proof of her husband's innocence), on her knees supplicates the emperor for justice. The emperor, being convinced by the fire ordeal of the count's innocence, orders the empress to be burnt at the stake.

From this tradition Steuber painted two pictures for the Town-hall of Louvain in 1468, on wood, each 117 inches French, by 66; the figures are about the size of life. In the first picture the emperor is listening to the false accusation of his count; in the second, the count is being executed; the actual beheading is represented in the distance. In the second picture the widow is kneeling before the emperor with the head of her husband and the red-hot iron in her hand, imploring the imperial intercession for the empresse. She is being burnt at the stake; in both pictures are various attendants. The execution is in the style of the Van Eyck school, and is extremely elaborate, especially in the second piece, which is superior to the first.

These pictures were fixed on the wainscoting of the justice-hall at Louvain, and by each was a panel containing an explanation of the subjects in the Flemish language, and in gold Gothic letters. They were very dirty, and fast approaching decay, when in 1827 they were purchased for a small sum by the late King of Holland, who presented them to the present king, then Prince of Orange. They were removed to and restored at Brussels, and were in the collection of the Prince of Orange there, until 1841, when they were placed in their present locality at the Hague.

In the above-mentioned MS. 'Annales et Antiquités de Louvain,' it is stated that Dierick Steuber painted these two pictures for the Council-hall in 1468, and that he was paid for them 280 crowns. In the same MS. it is stated that the middle of the 24th of May 1693, the same Dierick Van Harem, though that writer mentions them as two painters. Vasari mentions Dirie da Luvano. Steuber must have resided some time at Louvain. He was also from his style probably a pupil of Jan Provoost, and in some points of his art was equal to that artist. These two short extracts from the pictures prove that Steuber was a much better painter than many of the most celebrated of his followers; the proportions of his figures are better, his forms fuller and better modelled, and the heads are executed with less rigidity and stiffness of feature. M. Nieuwenhuyx and others give 1410 and 1470 as the respective dates of Steuber's birth and death, but how the information is acquired is not stated; Van Mander, who published in 1604, said nothing either. They appear to have originated with Otley, who makes some conjectures on the matter in his 'Early History of Engraving.'

(S.B., Messager des Sciences et des Arts, Ghent, 1833.)

 subsystem: [P. C. S.]

SUBLEYRAS, PIERRE, a distinguished French painter, was born at Uzes in 1699. His father, who was also a painter, was his first instructor, but at the age of fifteen he took his uncle in Paris, who in 1716 placed him in the studio of Boulanger, a painter of reputation in that part of France. In 1724 he went to Paris, and two years afterwards obtained the grand prize for painting given by the French Academy for a picture representing the death of St. John of Nepomuk. On his return to Rome, with a pension from the then government, and he remained there the remainder of his life, and acquired a great reputation. In 1789 he married a Roman lady, Maria Féliz Tiabin. On his death he left an unfinished picture which was bought a short time afterwards elected members of the academy of St. Luke. Subleyras was patronized by the popes Clement XII. and Benedict XIV., by several cardinals, and many of the Roman nobility. He painted Benedict's portrait, and was commanded by that pope to execute one of the altarpieces for St. Peters, to be worked in mosaic. The picture, representing St. Basil celebrating mass before the Emperor Valens, who is seated with a fasting fit, was finished in 1746, and after being exposed in St. Peter's for three weeks, was removed to the mosaic offices, and completed in mosaic before the death of Subleyras. He died at Rome of pulmonary consumption in 1757, and is buried in the church of St. Peter in Rome.

There are several fine pictures by Subleyras in Rome and in some other cities of Italy, and a few in France: there are eight in the Louvre. His execution was delicate, but he composed his pictures with too much a direct study of the Tintoret. His figures are larger in his oil pictures than in his altarpieces; among these three of the pictures which are in the Louvre—the Brazen Serpent, Mary Magdalen at the feet of Christ, and St. Brigid, restoring an infant to life. There is also a Holy Family by him.

(D'Argenville, Abrégé de la Vie des Peintres, &c.; B. Dumontel, Peintre-Grauvier Françoise.)

SUBULARIA (from subul-, a little sword, from the form of the leaves), a genus of plants belonging to the natural order Cresse- forme and the tribe Subulation. It has an oval-oblong, compressed pouch, with boat-shaped valves.

S. aquatica, S. awl-wort, is a little aquatic stemless herb, with fuscous, simple white fibrous roots. The radical leaves are linear and awl-shaped, the scape naked and flowerless, the pedicel filiform and bractless. It is native of the colder parts of Europe, in ditches, lakes, and ponds with muddy or gravelly bottom. It is also found plentifully in the north of England, Scotland, and Ireland. Sir W. Hooker and Sir J. E. Smith agree in stating that the flowers always remain several feet under water. No one is so far aware that, contrary to the general rule, fertilization must take place in that element. This curious little plant only requires to be planted or sown in a pond or rivulet, with a sandy bottom, or it may be grown in a pot filled with sand or gravel, and then plunged in water.

(D. Gardener's Dictionary; Babington, Manual of British Botany; Burnett, Outlines of Botany.)

SUC, the species of one of the tribes derived from the Roman 'Successio,' which signifies a coming into the place of another, and Successor is he who comes into such place. The Roman term signifies a coming into the place of another so as to have the same rights and obligations with respect to property which that other had. There might be succession either by coming into the place of a person living, or by becoming the successor of one who was dead. Successio (iii. 77) signifies a coming over or a passing over, an instance of which is the Honorum Cessio according to the Lex Julia. Succession was again either Universal or Singular. The instances of Universal succession (per universum) are the being made a person's heir, giving the possession of the bona of another, buying all a man's property, adopting a person by adoption, and admitting a woman into the union as a wife; in all of which cases the person succeeds to the property of another, and is a passing over at once to the person who was made heir, or got the honorum possession, or bought the whole property, or adopted another by adoption, or married the woman. An instance of singular succession is the taking of the legacy of another by a man's will.

The term Successio is used in our language. We speak of the succession to the crown or the regal dignity, and the term implies that the successor in all things represents the person who
cessor. Indeed, the king as a political person, never dies, and upon the natural death of a king the heir immediately succeeds. The English heir-at-law takes the descendent lands of his ancestor as universal successor; and the successor takes the châteaux royal and others of a similar nature. This takes place at the death of the universal successor. The general assignee or assignees of a bankrupt or insolvent take by universal succession.

Blackstone says that 'corporations aggregate consist of members, each of whom is a part of the corporation and are kept up by a perpetual succession of members, so as to continue for ever.' It is true that when members of a corporate body die, others are appointed to fill up their places, but they do not succeed to the property of the deceased, nor do they simply become members of the corporation. But it has been established in some cases (2 B. & Ad. 840) that the use of the word 'successors' implied that the legislature meant to establish a corporation; and yet it is certain that a foetus of land to a corporation aggregate without the word 'successors' is a valid grant. In a foetus to a corporation sole the word 'successors' is not necessary. The succession in the case of a corporation sole follows the nature of the Roman succession. In the case of a corporation aggregate there is no succession, and the rule that a corporation may be established by the use of the word 'successors' is a statute in no case on the erroneous understanding of the term 'successors.'

SUCCESSION, WAR OF, the name usually given to the war occasioned by the succession of the Duke of Anjou, grandson of Louis XIV. V Honoré of France in Spain, the last male descendant of the Spanish branch of the House of Austria, having no issue nor brothers, the succession to the Spanish monarchy appeared to belong to Maria Theresia, Queen of France, and her brother. The Threser menace to establish a crown of Spain for his son Charles, on account of Leopold's mother being aunt of Charles II. France and Bavaria, on the other hand, maintained that the renunciation alluded to could not prejudice the children, who held their right not by their mother, but by the fundamental law of Spain. Each of these powers endeavoured to influence Charles II. in their favour, and he was at length inclined to name in his will Joseph Ferdinand, Elector of Bavaria, as his successor. The early death of this prince, in 1699, revived the contending claims of the Houses of Bourbon and Austria.

These different claims having excited the apprehensions of a war, the parties interested [Partition Treaty, P. C.] were, on 15th March, 1700, between France, England, and Holland, the details of which will be found in another part of this work. By this treaty, a neutrality was established, by which the territory of Landau on the Rhine, which had long been an object of dispute between the Habsburgs and the House of Baden, became the presumptive heir to the Spanish crown, while the grandson of Louis was allowed the duchy of Lorena, together with the kingdom of the Two Sicilies and the province of Guipuzcoa in Spain. This treaty however was rejected by the emperor, and the consequences of his rejection proved finally fatal to the cause of his son.

On the death of Charles II. (Nov. 1, 1700) a secret will was discovered which named the Duke of Anjou sole heir to the whole of the Spanish monarchy. Though Charles had been influenced in drawing up this will by the intrigues of Madame de Maintenon, carried on through the Marquis d'Harcoeur, the Marquise d'Harcourt, and others, it was expected that a war, with Austria at least, must be the issue of his acceptance of the Spanish crown for his grandson, hesitated before availing himself of the offer, which was rendered the more presumptive by the general feeling of the inhabitants in favour of the House of Bourbon. A council which he summoned on the occasion gave its unanimous opinion in favour of acceptance, and indeed the French king immediately to proclaim the prince of Anjou as his successor, and the news of the death of his heir was the signal of a war which was one of the longest and most general in Europe. On the side of the emperor were the states of Germany, with the exception of Bavaria and Cologne. Most of the powers of Europe however acknowledged Philip V., who made his entry into Madrid on the 14th of April, 1701; and had Louis, at this time, prudently conciliated his measures, he might have secured to his grandson the peaceable possession of the throne of Spain and the universal succession. Peace was moreover of paramount importance to the French monarchy, drain as it was in its resources and weakened in its power by the war which had but lately been terminated by the treaty of Ryswick. [F. C. vol. xxvi. p. 174.]

Age and infirmities had diminished the energies and dampened the military ardour of Louis, while death had deprived him of many of the great men of his minister and general staff, who were the chief instruments in forwarding his reign so illustrious in history; Louvois and Colbert had disappeared from the political stage, together with Turenne, Condé, Créquy, and Luxemburg.

England and the States-General, though they had acknowledged Philip V., entertained fears lest the balance of European power should be disturbed by the union of France with Spain. Louis, on the other hand, far from attempting to dispel these fears, with singular impolicy issued letters patent in favour of Philip, to the effect of preserving his rights to the throne of France. Another measure equally impolitic was the encroachments made at that time by the French in the Spanish Netherlands, on the consequence of their consequent military approximations to the territories of the States-General. This latter measure gave an opportunity to William III. of Orange to engage the Dutch against France; but he found considerable difficulty in bringing the English Court to share his views. An event however soon occurred which removed these difficulties; it was the death of the exiled king of England, James II., and the recognition by Louis of his son as king of Great Britain. This was the pretext which the treaty drawn up at the Hague on September 7, 1701, and generally known under the name of the Second Grand Alliance, was signed by the plenipotentiaries of the Emperor of Germany, the States-General, and the King of England. The principal objects of that treaty are detailed in another part of this work. [Hague, Alliance of the P. C. S., in which by an over-night treaty of Charles III. is put for that of Philip V.] This alliance was subsequently prolonged by the Kings of Portugal and Prussia and the Duke of Savoy.

On the death of the King of England, his successor, Queen Anne, followed his policy in adhering to the alliance of the Hague [Annex, P. C.], and three months had not elapsed after her accession before war was declared by the powers united by that treaty against France (4th May, 1702). The commencement of the war for some time maintained the former glory of their arms, and defeated the Imperialists on the Upper Rhine, but the Earl of Marlborough [MARBOROUGH, THE EARL OF] had, however, succeeded in the Anglo-Dutch army, made considerable progress in Flanders, while the combined fleets of England and Holland destroyed a French fleet in the Bay of Vigo, The fortress of Ferrol was taken, and the Prince of Condé was defeated at Lévis of Baden. In Italy, Prince Eugene, who had the command of the German army, was unable, through the deficiency of his resources, to attempt any measure of importance.

_Eugene, P. C._

The following year was spent by Marlborough in reducing the fortified places on the frontiers of the Spanish Netherlands. In Southern Germany the contest was more unfavourable to the allies. The French Marshal Villars [VILAR, P. C.] had succeeded in crossing the Rhine and in uniting his forces with those of the Elector of Bavaria. In Italy and Alano the French had likewise the advantage in arms. Their cause however was considered in danger by the defection of the Duke of Savoy, who joined the allies, as did also the king of Portugal. The campaign of 1704 was more unfavourable to the French armies. Marlborough, having secured the safety of the Netherlands determined upon marching into Germany to the aid of the emperor, whose capital was menaced on one side by the French and Bavarian armies, and on the other by the Hungarians, who had taken the occasion of the war to attack a revolt, that was also resolved upon by the allies to unite the forces under the three Generals—Marlborough, Eugene, and Lewis of Liden, while General Stabenberg was to remain in Italy. The junction of their armies was arrived at at Heilbronn; but it was agreed among them that Prince Eugene should direct his march along the Rhine, while the two other generals directed their courses to the Danube. The passage of the Danube was

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bravely but unsuccessfully disputed by the Bavarians near Donauworth. Advantage was taken of their success by the allies to offer peace on favourable terms to the elector, if he would withdraw from the alliance with France. The advances of Marshal Taland with a French army of 30,000 men deterred the elector upon refusing these proposals; at the same time Eugenio had joined Marlborough with 20,000 men; the Prince Eugene was now the obstinate, in which Eustace should demand that their plans, was sent to reduce Ingolstadt. On the 13th August a decisive engagement took place, which terminated in the complete defeat of the French and Bavarians. The details of this important battle will be found in the articles BLESHEIM and MARLBOROUGH, P. C.

This disaster was followed by the loss of Bavaria, which was occupied by the Imperials, and the elector was compelled to cross the Rhine with his French, and to take up his position at Brussels. In Italy and Spain the French obtained some advantages, which however were counterbalanced by the loss of the important fortress of Gibraltar, which fell into the hands of the English on the 24th July, 1704. [GIBRALTAR, P. C.]

The next year, 1705, the Emperor Leopold died, and was succeeded by his eldest son Joseph, whose character for energy and determination formed a favourable contrast with that of his father. After some hesitation, he decided upon vigorously pursuing the war in support of the claims of his brother Charles, who the year previous had proceeded to Spain with an army of 40,000 men and 1200 horse. The French, who had been besieging Gibraltar, and were now 4000 in number, under General Lillo; Marshals Villars, with the French army of nearly equal strength, covered Dossay and Arras. Eugene and Marlborough, instead of attacking him, marched against the important fortress of Tourcoing, at the head of 40,000 men. These operations were directed against Mons, which place Villars was desirous of protecting, and he accordingly encamped within a league of it in a strong position and in bivouac. No siege was lost by the allies in attacking him in his intrenchments; and, after the contest the most obstinate and sanguinary during the war, victory remained once more on the side of the allies (11 September). [MAESTRICHT, P. C.] The surrender of Mons was the immediate result of this victory. Another campaign had terminated unfavourably to Louis; he again applied for peace, but the same disadvantageous terms were proposed to him, and the cruel alternative was again presented to him of continuing a disastrous war or of waging one against his child; as before, he chose the former.

The campaign of 1710 was marked by the reduction of Dossay and other strong places on the Netherlands frontier, and in Spain by the successes of Charles at Almenara and Saragos, which enabled him to enter Madrid. Reverses, however, soon attended his arms; fresh troops arriving from France, the allies took the offensive, and they were rejected chiefly through the influence of the pensionary Antony Heinsius.

In 1707 a considerable portion of the Spanish inheritance was gained by the allies, who, in the person of the Empress, had already been secured to them by the battles of Turin and Ramillies. Louis at this time determined upon a diversion in his plan of attack, which was soon followed by important consequences. The large body of troops which had been forced to evacuate Italy he collected together, and, placing them under the command of the Duke of Berwick [BERWICK, JAMES FIFTH DUKES OF, P. C.;], sent them into Spain, which he resolved to invade in an attack upon Barcelona; and the English and Portuguese entered Madrid, which city however they were unable to retain. At this juncture of affairs a suspension of hostilities was concluded between the allies, but they were rejected chiefly through the influence of the pensionary Antony Heinsius.

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of Marlborough of his influence, measures of peace were strongly advocated. [Anne, P. C.] Secret negotiations were set on foot between the Courts of England and France, which ended in a preliminary treaty of peace being signed in London on October 8, 1711. The conferences for a general peace, which took place at Utrecht was selected as the place where they were to be held.

The conference which took place at Utrecht in the early part of the year 1712 met with several interruptions, arising from the previous differences of opinion as to the right of the powers who composed the grand alliance. The victory obtained by Marshal Villars over the Earl of Albermarle at Denain (24 July, 1711) [Villars, P. C.], and the consequent recovery of Dunkirk, induced the Dutch to make peace with the French, and rendered the allies more tractable. Peace was at length signed at Utrecht in the month of April, 1713, between France and England, the United Provinces, Prussia, Portugal, and Savoy: the Emperor alone refused to take part in it. A full detail of the terms of that treaty will be found in another part of this work [P. C. vol. xiv. p. 174]. The real gain by it was undoubtedly the French King, who obtained no more than the advantages which it had been the object of the war to prevent his acquiring; it was also productive of considerable odium against the English ministry. [Harley, P. C.]

The terms of the treaty, now deserted by his allies, was compelled to negotiate alone a peace, which became important even for the security of his hereditary states. It was brought about by the moderation of the two great generals Eugene and Villars and Joubert's staff. The terms of peace, in which they had fought, proved themselves the most desirous of promoting peace. They communicated negotiations at the Castle of Hastings in November, 1712, and a treaty was there concluded on the 7th March, 1713 [Kastorf, P. C.]; and the terms of it were definitely agreed upon on the 7th September following at Baden in Austria. [Baden, TREATY OF P. C. vol. xiv. p. 174.]

The King of Spain acceded to these treaties, and to the deserts of peace, and signed the treaty at Aix-la-Chapelle.


SUCKET, LOUIS GABRIEL, Duke of Albufera and Marshal of France, was a native of Lyon, where his father was a manufacturer. The year of his birth is stated by some authorities to have been 1770, by others 1772. On the break-up of the French Revolution, he was appointed to the position of a volunteer in the cavalry of the national guard of Lyon; shortly afterwards, he became captain of a volunteer company raised in the department of Artois, which he commanded during four months, when he was appointed to the command of a 'bataillon' in the troops of the above-named department. In his capacity, it is stated, he was compelled to be the active witness of many atrocities, committed in the name of the law by the deputies of the convention, Majeur. He was present at the siege of Toulon in 1793; from thence he was transferred to the army of Italy, and was attached to the brigade under the command of General Lafayette. In this campaign he was distinguished himself at the combat of Longjumeau (23rd November, 1795), where he captured three Austrian standards. He afterwards served with distinction in the same campaign under the command of the General Augereau [Augereau, P. C.], and Massena [Massena, P. C. S.], and received several wounds. He was selected by Massena to present to Bonaparte the standards which had been captured during the year 1795, in which he was born. It was on the field of battle of Neumark (2nd April, 1797) that he was raised to the rank of 'chef de brigade.' He afterwards joined the army in Switzerland, where he was instrumental to the conclusion of the Treaty of Aarau, at Berne and Bressbourg. This treaty did not prevent the war being rekindled in Switzerland, and in it Suchet displayed considerable skill; it was there that he first gave proof of his abilities as a tactician, which afterwards raised him so high in the estimation of Bonaparte. The important part which he acted in this campaign was recognised by his chief, who deputed him to Paris to present the Directory twenty-three standards taken from the enemy.

When the expedition to Egypt was determined upon, it was originally intended that Suchet should be included among the military commanders selected to act under Bonaparte; the disordered state of affairs, and disbandment of the army of Italy, and the representations of General Brune, who commanded it, caused him to be retained there with the rank of Major-General of Brigade. In his new and important position he made many strenuous endeavours to renew the ancient discipline and to anestimulate the condition of the soldiers; these endeavours were construed by the suspicious government at Paris into an attempt to introduce in the army a new and aristocratic rule. His record was declared unsuited to the strong remonstrances made on the subject by General Joubert, who was amongst the most popular and successful of the republican generals of that period. On his arrival at Paris, he succeeded in clearing himself of the charges which had been brought against him, and he was transferred to a command in the army of the Danube. He there rendered himself conspicuous by the able manner in which he reconciled the skilful manoeuvres of General Masséna in the Grisons. [Masséna, P. C. S.] The successes which attended the French armies in Switzerland were counterbalanced by the disasters of General Schérer in Italy; these disasters necessitated the immediately appointment of a vigorous commander, and Joubert was again intrusted with the chief command. On this occasion Suchet was recalled from the army of the Danube, and placed at the head of the troops, and to his military reputation; the careful avoidance of error in his movements and manœuvreurs, the skilful disposition of his troops, whether acting independently or in conjunction with the main army, as they procured him important successes. Soon he attracted the notice of Bonaparte when he joined the Italian army, and he was appointed by him second in command to Masséna. In this capacity he particularly distinguished himself in the actions of Sarrener, Mondovi, and the bridge of Ceicio (7th and 8th May, 1800). With a body of eight thousand men, advantageously posted, he checked the advance of General Mélas, who had five times his numbers, and for a long time harassed his army, whose retreat he had cut off; he thus afforded a powerful co-operation to the main army of the French, which, under the command of Bonaparte, was at that time crossing the Great St. Bernard. [Bonaparte, P. C.] General Suchet, after these operations, rejoined Masséna on the plains of Alesandria, and was present at the battle of Marengo. When, in consequence of this decisive battle, the city of Genoa again fell into the hands of the French [Masséna, P. C. S.], the Emperor Napoleon sent to Suchet a letter giving him the command of the main army of the French, which, under the command of Bonaparte, was at that time crossing the Great St. Bernard. [Bonaparte, P. C.]
ally contributed to the success obtained by Savary, Duke of Rovigo, over the Russian General Essen, who, with twenty-five thousand men, attacked the French on the banks of the river Narrew (16th February, 1807), and was repulsed with great loss to his side, and with great loss. The reputation which Suchet had acquired in these engagements, as a brave soldier and a skilful tactician, induced Napoleon to entrust him with a separate command. An opportu-

nity was afforded to test the value of the French army in the Peninsular War, by a successful invasion of Spain in 1808, and he gave him the command of the fifth division of the army, having previously raised him to the high grade of the Legion of Honour. Suchet's services in Spain were acknowledged by the commission of 20,000 francs, and the title of Count of the Empire. After assisting for a short time at the siege of Saragossa (SARAGOSA, P. C.; LAMBE, P. C.S.), he was appointed to the important command of Governor and chief of the French army in the province of Aragon. This brought us to the most illustrious period of this general's military life; the campaigns which followed under his command, are among the most brilliant recorded in history, and it is to be regretted that sufficient justice has not been rendered to his merit by the English annalists of this war, previous to the time of General Napier. To this distinguished and impartial historian has been reserved the honourable task of raising the character of an enemy to the position he deserves in public estimation. When General Suchet was placed at the head of the forces in Aragon, he found the army so demoralised and dispirited as to be reduced to disorder and demoralisation. In applying the measures to restore this discipline, he evinced considerable discernment, prudence, and energy; no longer thwarted in his efforts by the factional opposition of mere theatrical statements, and uncontrolled by the influence of the Direction, he was able to specify effects and accomplish much greater ends. This important purpose, "Suchet," says the historian above referred to, "was no ordinary man; and with equal vigour and prudence he commenced a system of discipline in his corps, and of order in his government; that afterwards carried on by himself, with scarcely a check, from one success to another, until he held the rank of marshal for himself, and the honour for his corps of being the only one in Spain that never suffered any signal reverse." (Napier, History of the Peninsula, War, vol. ii, p. 97.) In 1810 General Suchet received orders from Madrid to lay siege to the strong fortress of Lerida, the approaches to which were covered by the Spanish General O'Donnell and a strong body of Catalan troops. The defeat of this general was followed, after a gallant and obstinate resistance, by the surrender of the fortress which he had protected (14th May, 1810), in which were found five hundred pieces of artillery. The fall of Lerida was followed by that of Mequinez (8th June, 1810), and Tortosa (2nd January, 1811). These successes were followed by one still more important, the taking of the city of Tarragona (TARRAGONA, P. C.), which was defended by a garrison of eighteen thousand men; the city fell into the hands of the French after a siege of two months, or rather, as Suchet himself expressed it, after a succession of three sieges and five assaults. This victory was also marked by a French achievement of five thousand cannon and abundant munitions. (TARRAGONA, P. C.) The auspicious nature of this siege may be judged from the fact that upwards of nine thousand Spaniards of the garrison are said to have perished. The occupation of Mont-Serrat, a place of such great strength that it was deemed impregnable, followed soon after the capture of Tarragona. These brilliant services were justly appreciated by Napoleon, who rewarded them by raising Suchet to the dignity of a Marshal of the Empire. In the latter end of the year 1811 Suchet directed the operations of his army against Murviedro, the ancient Saguntum (HANIBAL, P. C.), the fortifications of which had been constructed by a considerable expense; the defeat of General Blake and thirty thousand men under its walls, was followed, after about a month's siege, by the fall of this important fortress. A reinforcement of fresh troops having arrived from Navarre, Suchet next proceeded to invest the city of Valencia, which surrendered to him by capitulation on 10th January, 1812. The fall of this city, and of some fortresses in its neighbourhood, was followed by the occupation of the city of Huesca, one of which it was declared that had been the scene of his last successes, became the title of the dukedom to which he was raised by Napoleon, with all to this title an extensive and valuable domain. But he obtained the title of the dukedom by the posteriority of the general expression of the Spaniards under his rule, that he mitigated the horrors of war by his humanity, and dealt equal justice to the conquerors and to the conquered. "The mission imposed upon him had been to conquer and to subdue: he was required to provide for the expenses of the war by the success of war; the mission, however, which he imposed upon himself was to augment the power of Spain, to increase its dignity, and to diminish the taxes of people artisans, and cultivators, and to compose of enlightened and respectable men. He called together an assembly of persons of every class of society, and representative of every province, and reduced the war and equity to divide its burdens; and in them he render a faithful and detailed account of the manner in which these taxes were employed. He manifested the same spirit of confidence and justice towards the soldiers under his command, and found it productive of the most beneficial results." The success which attended the British arms under Lord Wellington, and the decisive victory which he obtained at Vittoria, compiled a large portion of the French army to retreat beyond the Pyrenees, and, in consequence, Suchet found himself under the necessity of abandoning the eastern provinces of Spain, and to fall back upon Catalonia, where he maintained himself for some time. Obliged at length to evacuate this province, and to retreat towards the frontiers of France, he effected this retreat in the attitude of a conqueror, and secured the submission of the provinces in his path. The occupation of Narbonne, he signified, on 14th April, 1814, his adhesion to the decrees of the senate directed against Napoleon. Employed to receive Ferdinand VII. (Ferdinand IV.) of Spain and Casimir P. C. at Bordeaux, he was present at the abdication of the King of Spain and the assassination of the Duke of Berri. He accompanied the King of Spain to the French army, and to present him to the Spanish army, he was publicly thanked by the king for the manner in which he had carried on the war against his subjects. The gratitude of the Spanish nation for the administration of the war was further evinced by the general testimony which was borne to his justice and humanity, when, in 1823, the French saint occupied the scene of his exploit. The correct view taken by Suchet, with regard to the life of Ferdinand, will be seen by reference to Montblonhol, History of the Captivity of Napoleon, vol. ii, p. 350. The speedy adhesion of Suchet to the Bourbons was rewarded by his being created a member of the new peerage, and his appointment to the command of the tenth military division, of which the head-quarters was Strasbourg. On the return of Napoleon from Elba, though he retained his fidelity to the Bourbons, in 1815, he was hurried back to France, he renewed his allegiance to his former chief, and accepted the command of the army of the Alps, with which he obtained several important successes over the Piedmontese, and reduced to submission the state of forty thousand men, and on the approach of the main body of the Austrians, nearly one hundred thousand strong, he was com- pelled to fall back upon Lyon, for which city, by his judicious management he was made a member of the council of the city and condottier of Lyon. Suchet, in the face of the conditions in it being that all the valuable munitions of war contained in that city should be respected by the enemy. On the second restoration of the Bourbons, he remained for some time in disgrace, and was deprived of his civil though not of his military honours. He was however re- stored to his position in the peerage by a royal ordinance, dated the 6th of March, 1818. That he entirely recovered the favour of the king may be presumed from the fact that he was chosen to assist at the birth of the present Duke of Bordeaux. On the French expedition to Spain, in 1823, it was generally expected that Marshal Suchet would have been selected to accompany the Duke of Angoulême, as his principal advisor, but he was already suffering severely from the disease to which he shortly afterwards fell a victim. He died at Marseille on the 7th of January, 1826, leaving behind him a young widow and several children. During the latter years of his life he was occupied in composing a memoir of his campaigns in Spain, which has since been published. (McC.theros, Hist. of the City of Berlin, p. 574.)
The reputation of Suchet stands deservedly high amongst the generals of Napoleon. His military career was uninterrupted by any of the excesses which have disgraced so many of his contemporaries. Brought up in the school of Masséna, he rivalled his military skill without imitating his vices. It is true that his entrance by storm into Tarragona was marked by the rapine and inhumanity of his soldiers; but he spared the lives of the defenders of our own army at Badajos and St. Sebastian, and it would be unjust to throw the odium of them on his illustrious commander. The inability of a chief perfectly to restrain the frenzied violence of his soldiers on such terrible occasions is a melancholy fact which the history of all ages has established. We have already dwelt upon his qualifications as a military and a civil ruler. The high opinion entertained of Suchet by Napoleon has been recorded by Valfré, Le Bas, and Las Cases. On the question being asked him by the former, who, in his opinion, was the first of his generals? he replied, 'I think that Suchet is probably the first. Massena was; but you may say that he is dead' (1817), alluding to the complaint under which that marshal was fast sinking. On another occasion, at St. Helena, Napoleon remarked, 'that if he had had two such field-marshals as Suchet in Spain, he should not only have conquered, but kept the Peninsula. His sound judgment, his governing yet conciliating spirit, his military tact, and his bravery had procured him astonishing success.' (Cour and Camp of Bonaparte, p. 410.)

SUCHOSAURUS, the name given by Owen to a fossil Saurian, of which the remains were discovered in the strata of Sault-Hellas, in Southern France. The remains consist of a number of plates, containing the remains of the bones of a Sauropsidian, but such as do not belong to the Sauria. The name is derived from Suchan, a town near Sault-Hellas, whence the remains were discovered, and saurios, a dragon, in Greek.

SULPHURATION, or SULPHURING, is the process of bleaching employed to give whiteness to silk and woollens by exposing them to the fumes of burning sulphur. For this process a detached chamber, without a chimney, is made use of, but so constructed that, when required, a current of air may be passed through it. According to Berthollet, 100 pounds of silk, stuck on perches, are placed at a height of nearly seven feet, and about two pounds of sulphur, reduced to coarse powder, are put into an iron pot, containing a small quantity of ashes; the sulphur is fired in several places, and the chamber well closed to prevent the loss of sulphurous fumes; afterwards the windows are opened to let them escape and to dry the silk. In winter, after the smell of the sulphurous vapour has ceased, the windows are shut, and charcoal is burnt in the chamber, in order that the sulphurous fumes may be absolved. The silk becomes perfectly white, and is rendered fit for subsequent operations. Woollen cloths are treated nearly in the same manner.

SUMMARY CONVICTION. [Law, Criminal, P. C. S.]

SUMMER. [Winter, Spring, Summer, and Autumn, P. C. S.]

SUPERCARGO. [Ships, P. C. S.]

SURFACE OF ELECTRICITY. [Polarization of Light, P. C. S. p. 330.]

SWITZER COLLEGE OF. [Surgons, College or, P. C. S.]

TENEMENTS, of Surgons, College or, London, COLLEGE OF. [Surgons, College or, P. C. S.]

The new charter was granted to the College of Surgeons in the 7th year of Victoria, by which it is declared that the name of the college shall henceforth be the Royal College of Surgeons of England; and that a portion of the members of the said college shall be fellows thereof, by the name of The Fellows of the Royal College of Surgeons of England. The charter declares that the present president and two vice-presidents and all other the present members of the said council of the said college and such other persons, not being less than 250 nor more than 300, and being members of the said college, as the council of the college, at any time before the expiration of three calendar months from the date of the said charter, shall by vote, be fellows in manner by the charter directed; together with any such other persons as the council of the said college, after the expiration of the said three calendar months and within one year from the date of the charter, shall appoint in manner by the charter authorized, shall be fellows of the said college. But no person, except as hereinbefore named, is to be a fellow before the age of twenty-five years, and compiled with such rules as the council of the college shall think fit and by a by-law or by-laws direct; nor unless he shall have passed a special examination by the council of the college. But no member shall be admitted as a fellow, as last mentioned, is to become a member of the College by such admission, if he is not already a member. Henceforth no member of the College who is not a fellow is to be eligible to a member of the College. And any person who shall have been elected by the council, either from the members of the council or from the other fellows of the college, or from both of them; and all future examiners of the College shall hold their office during the pleasure of the council. The charter contains other regulations, and confirms the powers of the college and the council, except so far as they are altered by the charter; and it declares that no by-law or ordinance hereafter to be made by the council shall be of any force until theウンshan shall have signified its approval thereof to the College under the hand of one of the principal secretaries of state, or otherwise as in the charter stated (22). The by-laws and ordinances of the Royal College of Surgeons are declared to remain in force, and the regulations as to the candidates for the fellowship (sect. 1), for the examination of candidates for the fellowship (2), admission of fellows (3), election of members of council (6). By section 1 it is required that every candidate for the fellowship, among other certificates, shall produce a certificate, satisfactory to the court of examiners, that he has attained a competent knowledge of the Greek, Latin, and French languages, and of the elements of mathematics. The subjects of examination for the fellowship are Anatomy and Physiology on the first day, and Pathology and Therapeutics and Surgery on the second day. The examination is to be by written answers and oral examination. The examination of each candidate may be interrogated by the examiners, on any matter connected with the questions or answers. In the anatomical examination the candidate must also perform dissections and operations on the dead body in the presence of the examiners.

The members of the College are admitted by diploma after examination before the court of examiners, and their diplomas confer upon them the right of practising surgery in any part of the British dominions.

The council of the College have at various times required certain qualifications of age, education, &c. from candidates for examination. The regulations last issued are dated October, 1841.

The examinations of members are conducted twice a year, or, if the candidate desire it, in writing. The examinations are almost exclusively anatomical and surgical, and the examination of each candidate occupies about an hour and a half, during which time he is usually questioned by four of the examiners in succession. According to the financial statement (June, 1843), the receipts of the College for the previous year were as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Court of examiners; fees for diplomas, &amp;c.</td>
<td>£1,949 0 4</td>
</tr>
<tr>
<td>Rent</td>
<td>£15 76 6 7</td>
</tr>
<tr>
<td>Incidental sale of lists, catalogues, &amp;c.</td>
<td>£10 6 6</td>
</tr>
<tr>
<td>Dividends on investments in government securities, &amp;c.</td>
<td>£1,499 0 4</td>
</tr>
</tbody>
</table>

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for the case in which the reflecting surface is a plane, that it is not necessary to prove that the equal angle of incidence and reflection is that of the ray of light parallel to the normal, having been given only that of the ray parallel to the tangent plane, and that this is that angle which the line joining the point of reflection to the intersection of the tangent plane with the axis of incidence makes with the plane of incidence.

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Next, imagining Q to be very near N, let fall QP perpendicularly on NN', and QP perpendicularly on QQ'; then

\[ NT = NN' - QQ', \text{ and } NT = NN' - QQ'; \]

or, substituting the values of NN' and QQ',

\[ RQ = \frac{NN'}{NN'} - QQ'; \]

therefore

\[ NQ : NT = 1 : R. \]

Now NQ being considered as a straight line, it is a common hypotenuse to the right-angled triangles NQP and NQ; hence

\[ NQ : NT = \sin NQ : \sin NQ. \]

But ZQ and NQ' being perpendicularly to the refracting surfaces, NQ' is the complement of ZQP, and is therefore equal to the complement of QQ' or the angle of refraction of the second velocity through S and touching the surfaces of the several waves would fall between SN' and SS' : such surface would then be the front of the refracted wave; and thus the front would, in a given time, pass through a least interval from the reflecting surface (or from the radiating point) than it actually passes through in consequence of the partial waves taking the directions NN' and QQ'. In like manner with respect to refraction: if the wave velocity be less than that of the front of the wave, it is evident that the curve surface passing through S and touching the surfaces of the several waves will fall between SS' and SN'; such surface would be the front of the refracted wave; and the conclusion corresponds to that which has been stated for a refracted wave. Therefore in both cases the time, reckoning from the moment of setting out from the radiating point, or from the reflecting or refracting surface, during which the general wave arrives in any given position, as \( SS' \), will be the least possible.

SWITHIN, ST. Albans. Edward Bishop of Winchester, was born in the early part of the ninth century, but the exact year is not ascertained. He was ordained priest in 880 by Dunstan, Bishop of Winchester, and was soon after appointed by King Egbert to the see of Winchester. He is said to have been the son Ethelwine. In the reign of the latter he became chancellor, and was intrusted with the education of Alfred, whom he accompanied to the Holy Land. The see of Ethelwine was assigned to Swithun to Ethelwine in 918. His bishopric was the ecclesiastical affairs of his kingdom were rewarded by his elevation in 952 to the see of Winchester, vacant by the death of Helgenst. He is supposed to have been the originator of the payment of Peter's Pence to Rome, though there is much reason to believe that this tribute had an earlier origin. Peter's Pence, P. C., and also to have procured the first act of the Witenagemot for enforcing the uniform payment of tithes.

William of Malmesbury says of St. Swithin that he was a rich treasure of all virtues, and that those in whom he took most delight were humility and charity to the poor. He adds that he acquired the name and devoted himself exclusively to the spiritual administration of his diocese; in his frequent visitations of it, he travelled with his clergy on foot, and for the most part by night, in order to avoid the suspicion of restitution. He died on the 2nd July, 862. His last request was that he should be buried in the churchyard of Winchester, 'ubi cadaver et pedibus praeteractum et stillificdas e coelo coronas ineditas esse omnia.' His name being admitted into the calendar as that of a canonized saint, it was resolved to transfer his remains to the cathedral, and to place them in a magnificent shrine prepared for the purpose by his great friend Aldhelm, abbot of Malmesbury. This latter, who died on the 15th of July, was decayed for forty days in consequence of the severe rainy weather which occurred, and hence arose the well-known tradition of which the prevailing notions are thus expressed in a Scotch proverb:

'Saint Swithin's day, gie ye do mae, For forty days it will remain; Saint Swithin's day, an ye laic, For forty days tae rain nae mae.'

In France the day of the festival of St. Gervais (19th June) is marked by a similar superstition:

'Saint Gervais jour, an ye laic, For forty days tae rain nae mae.'

These superstitions are not however altogether unfounded, as experience having shown that whenever a wet season sets in about the end of June to the middle of July, it generally lasts for forty days, which corresponds to the majority of our summers, a rainy season of about forty days, often set in nearly at the time indicated by the tradition of Saint Swithin. (See an interesting paper on the subject in the Penny Magazine for 1832, p. 140.)

The festival of St. Swithin in the Roman Martyrology is the 2nd of July, the day of his death, but in England it was celebrated on the 15th of July, the day appointed for the translation of his relics to the Cathedral of Winchester.

[Winchester, P. C.]


SYCOCHRUS, a genus of fossil Cricoida from the mountain limestone of Yorkshire. (Austin.)

SYDENHAM, CHARLES EDWARD POULETT THOMSON, LORD, was the son of John Poullet Thomson, Esq., of Waterley Abbey and Roehampton in Surrey, the head of the mercantile firm of J. Thomson, T. Bonar, and Co., which had been long one of the most eminent houses engaged in the Russian trade. Mr. John Thomson, who assumed the name of Poullet by sign-manual, in 1820, in memory of his mother, married, in 1781, Charlotte, daughter of Dr. John Bonar of Culross, and by her he had a family of nine children, of whom the subject of the present notice, born at Waterley on the 13th of September, 1799, was the youngest. There were two elder sons, Andrew and George, of whom the latter, now George Poullet Scroppe, Esq., is the present member for Stroud, and the author of 'Principles of Political Economy,' 12mo., 1839, and of 'The Life of Lord Sydenham,' 8vo., 1848.

Charles is stated by his brother to have been remarkable in his infancy for his grace and beauty; but the story which he tells of the child, who had attracted the notice of George III. at Weymouth, in the summer of 1805, having been placed by his majesty in the army of the guards, 'he cannot be correct in all respects;' for Mr. Pitt was not then prime minister, as is assumed, and could not have been in attendance upon the king in that capacity. It seems unlikely indeed that he should have been with the king all in that year. Lord Sydenham was never at any public school or university; and he left his native country at the age of sixteen, to be placed in his father's house of business at St. Petersburgh, and then under his direction in his absent brother. He returned to England in ill-health in 1817; then made a tour to the south of France, Switzerland, and Italy; after which he took his place in his father's counting-house in London, in the summer of 1819. In the spring of 1821 he was again sent out to St. Petersburgh, this time as a partner in the firm; and here he remained for two years. The greater part of the winter and spring of 1824-5 he spent in Vienna; whence returning by Paris to England, he assumed, in conjunction with his brother Andrew, the chief conduct of the business in London.

Sanguine, ambitious, and self-confident, he involved himself to some extent in the American mining speculations of 1825. Meanwhile he had become intimate with the late Mr. Bentham and Mr. James Mill, with Mr. Warburton, Mr. Home, Dr. Bowdler, and Mr. Croker, and had set his heart upon entering public life. He obtained a seat in parliament for Dover, after an expensive contest, at the general election in the summer of 1826. His rise from this date was very rapid. Voting steadily with the extreme section of the Opposition, he spoke but seldom, and almost exclusively upon commercial questions. On the first occasion however on which he delivered himself at any length, in a speech which he made on the subject of the Reform Act in May, 1827, he made a very favourable impression on the House, and had the gratification of being warmly complimented.
by Mr. Hukisson. After this, whenever he rose he was listened to with attention. He was again returned for Dover in 1830; and when the Whigs came into power, in November of that year, he was appointed to the Hereditary Seat of Vice-Admiral of the Board of Trade and Treasurer of the Navy. He was returned again for Dover after his acceptance of office, and also to the succeeding parliament, which met in June, 1831. At the general election in December, he was returned both for Dover and for Manchester; he elected to sit for the latter place; and continued to represent Manchester as long as he remained in the House of Commons. Meanwhile on the recommendation of the Minister in June 1832, arising out of the secession of Lord Stanley and Sir James Graham, Mr. Poulett Thomson was made President of the Board of Trade, in the room of Lord Auckland, who was removed to the Admiralty; and on the recovery of power by his party in April, 1835, after Sir Robert Peel's short administration, he resumed that office with a seat in the cabinet. So early as in the beginning of the year 1836, if there be no misapplication of the date in Mr. P. Scrope's narrative, it had been in contemplation to remove him to the House of Lords, in order to relieve him from the fatigue of the long-sitting in the Commons, under which his health was already beginning to break down; but circumstances, it is added, for a time put a stop to this plan. At last, towards the close of the session of 1839, on the elevation of Mr. Scrope, being by his choice between the chancellorship of the exchequer and the government of Canada; and accepted the latter. He was sworn into his new office before the Privy Council on the 29th of August; he arrived in the 19th of September, and landed in Quebec on the 19th of October. Of his administration in Canada, which was highly successful, Mr. Scrope has published a very full narrative, which was drawn up by Mr. Murdoch, the civil secretary. In August, 1840, the government-general was raised to the peerage by the title of Baron Sydenham, of Sydenham, in Kent, and Toronto, in Canada. But on the 4th of September, 1841, while in a weak state of health, he had misfortune to learn that his horse, which stumbled and fell upon him, and to sustain a fracture of the principal bone of his right leg, besides other serious injuries; and his death followed on Sunday the 15th of the same month. The most remarkable quality that Lord Sydenham possessed was great decision of character, arising from clear-headedness and self-reliance. His activity, zeal, and extensive information also made him an excellent man of business, and his very attractive manners added to his value as a partizan. (Memoir, by G. Poulett Scrope, Esq., M.P.)

SYENE. (Egypt, P. C.)

SYLVESTER, JOSUA, was born in 1683. He appears to have engaged in mercantile pursuits; and was a merchant of the company of merchant-adventurers at Stade, for whose secretaryship he was a candidate in 1697, recommended by the English Company of Merchants in Stade. His father, however, had always remained a poor man, and to have been of a roving disposition. At the latter end of his life he emigrated to Holland, and died at Middelburg in 1618. Both in his opinions and in his choice of friends he was destitute; and the numerous works, chiefly translations from the French, which he ever possessed, his literary reputation, show a warmly devotional and serious tone of feeling. He was not however remiss in courting the patronage of the great. To King James VI. he addressed many salutary dedications; and it was probably in compliment to him that he selected the topic of one of his original poems, which is thus entitled: 'To Tobacco botted, and the Pipes shattered (about their Ears that idly isolate so base and barbarous a Weed, or at leastwise over-love so lusomthe a Vanity), by a Valley of holy Shot thundered from Mount Helicon.' He is chiefly known now on account of the obligations said to have been incurred by Milton to his principal translation, that of the 'Divine Weeks and Works' of Du Bartas. [BARTAS, D., P. C.] There are two collected editions of Sylvester's works, both in folio, and commencing with 1672 and 1674. The dates are 1663 and 1681. The second of them contains a supplement of posthumous poems; among which is that tasteless alteration of the 'Round Ears,' which caused this fine poem to be erroneously attributed to Sydney.

SYMPHOEUSIS (from sympoiesis, compression, and pseu, measure), is an instrument which was invented by Arti, of Edinburgh, in 1619, to serve as a barometer, for the purpose of measuring the degree of the atmosphere, or exhibiting the variations of its density near the earth. An account of its construction is contained in the first volume of the 'Edinburgh Journal of Science.' It consists of a glass tube B about eighteen inches long and seven-eighths of an inch in diameter, externally and internally: at the upper extremity is a cylindrical vessel A half an inch in diameter internally and two or three inches long; and there is a hole in the bottom of it in which the vessel is fixed, and in the former vessel C, of about a half an inch in diameter internally, terminates also in a vessel C of an oval form horizontally. The vessel A and the upper part of the tube B are filled with an elastic fluid, so that, when the vessel being inverted, the vessel C and the lower part of the tube contain a-)lmond-oil tinctured with some colouring matter, as suchas root. In order to introduce the gas and oil, the extremities a and b of the vessels A and C being open, and the former extreme being drawn in the form of a slender tube, the instrument is quite filled with mercury; then, being held in a horizontal position with the orifice b covered by the finger, that the mercury may not come out, the slender pipe at a is put in communication with the gasometer. The hydrogen gas entering at a, and the instrument being now held in the horizontal position, on removing the finger from b the mercury will flow out till its upper surface is at the same level in the tube B and the vessel C, the gas occupying its place in the former. The extremity a then being communicated with the atmosphere, and vessel C being inverted, the mercury in C runs out, while that which remains in the tube B prevents the gas from escaping. The instrument being afterwards returned to its former position, the vessel A uppermost, the oil is poured into the vessel C: then, the gas being heated, by its expansion it drives the mercury in B into the vessel C; and, the instrument being now held in an inclined position, the oil is by the pressure of the atmosphere forced into the tube, in proportion to the gas by cooling becomes contracted in volume. The remaining mercury is lastively poured out of the vessel C; and the end b being left open, the pressure of the atmosphere on the oil is, the instrument being again put in a vertical position, a counterbalance to the weight of the column of oil in B and to the expansive force of the compressed gas which is in the upper part of the tube and in the vessel A.

In order to form a scale for the symphoeusis, the instrument, together with a good barometer and a thermometer, must be placed in a glass receiver in which, by proper syringing, the air may be rarified or condensed at pleasure: then, on bringing the air in the tube successively to such states with respect to density, that the top of the column of mercury in the barometer may stand at 27, 28, 29 and 30 inches, and marking the points on the tube or frame of the symphoeusis at which these states coincide, the number of points will be in those states, the distance between every two of these points being divided into one hundred equal parts, the scale p q of the instrument is constructed. The particular graduation at which, on the top of the column of mercury an inch should indicate the number of inches and hundredths of an inch at which the top of the column of mercury in a barometer would stand at the same time in the same place. But the volume of the hydrogen gas changes in consequence of variations in the temperature of the atmosphere; and therefore a correction, depending on the amount of the variation in the volume of gas for given increments of heat, should be applied to the number of the graduation on the scale of the symphoeusis in order to obtain the true height of the mercury column in a barometer. But, to avoid the trouble of computing and applying this correction, the scale p q of the symphoeusis is made to slide on one side of a scale r which is graduated like that of a thermometer, by communicating different degrees of heat to the vessel C, and observing the points at which the top of the column in B indicates the same number on the scale r as it would express, in degrees, the temperature of the gas; and the scale p q being moved till its index (at 294 inches) coincides with the degree of the scale r corresponding to the temperature of the atmosphere, on the scale of the degrees of a thermometer r attached to the instrument, the graduation on p q corre-
sponding to the top of the column of oil in B expresses the height of a column of mercury in a barometer.

Dr. Robert Gordon, the writer of the article Meteorology in the 'Edinburgh Encyclopedia,' having made a series of obser-
vations for a year, found the indications of the sympometer and those of a barometer, found that the
former stood higher than the latter by quantities varying between 0.03 inch and 0.017 inch, the temperature varying be-
tween 42° and 60°, which was at the same time that, in general, the difference between the indications of the
two instruments increased as the temperature and pressure diminished. The excess of the indications given by one in-
strument over those given by the other may be conceived to have arisen from some inaccuracy in the construction of the
sympometer: but the variation of the excess is not so easily accounted for; it may, however, be supposed to be caused in part
from some absorption between the oil and the gas. It is inferred, therefore, that the indications of the sympometer cannot be relying on accurate measures of the density of the atmosphere; but, since it has been observed that the instrument is frequently affected by changes in that
density, which are too small to be perceived on the scale of a barometer; and since it is well known to be less deranged than the latter instrument by the motion of a ship at sea, it follows that the sympometer has a marked advantage as a marine barometer in indicating the approach of gales of
wind.

SYMPLOCARUS, a genus of plants belonging to the natural order Araceae. It has a succulent spadix, a short
spadix covered with tetrangular flescules. The ovaries are one-celled, with one ovule in each and a minute stigma.
The berries are consolidated, the seeds without albumen. S. fistulosus, Skunk-veed or Skunk-cabbage, has a large
inflorescence with numerous crowded fleshy flbers. The spadix is pro-
cocious, ovate, turged, various in width, spotted, and sometimes covered with dull brownish purple. The spathe is oval, on
a short peduncle covered with perfect tetrahedral flowers, and of the same colour as the spadix. It has hairy
edge-shaped sepal, truncate at the top, and edges inflated; the 4 stamens are opposite the sepals with subulate filaments equal in length to the
calyx. When the spadix decays, the spadix continues to grow,
and every part of the plant, except the sepal, is at the same
level. Within the spathe at the base of each style is a round fleshy seed as large as a pea, white, tinged with green and purple, and invested with a separate membranous coat, and with a prominent
embryo situated in a depression at the top. The leaves spring
up some time after the flowers; they are numerous, large,
pointed, oblong, heart-shaped, and on long channelled petioles.
The plant emits an offensive odour; its tubers are acid, but when dried and powdered, are antispasmodic.

It is considered an excellent remedy in asthma, catarrh, and chronic coughs, and has also been employed in dropsy, rheumatism, and epilepsy.

(Lindley, Flora Medicina.)

SYNÁTHOCRINUS, a genus of fossil Crinidea from the mountain limestone of Holland forest. (Philippi.)
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TABLE. Since the article Table, P. C., appeared (in 1842) we have kept an eye upon it, with a view to its correction and amplification in this supplement. We were obliged to take much of our article from the description of other writers: though we had ourselves seen a majority of the books we cited. We have since seen many more, and have found several errors in our sources of information; but not more than, in the general laxity of bibliographical description, we were prepared to expect. We shall take the subjects in the same order as in the article above referred to; and when a table is merely mentioned by the author's name in the present article, it will be found in the former one with fuller description.

The restoration of the old numerical type, namely, that in which all the figures except 0, 1, 2, have a head or a tail, and in which the thickness does not vary sensibly from one part to another, was adopted and recommended by the Astronomical Society at the end of 1842; but it had previously been used by Mr. Baily in his detail of the Cavendish experiment, which forms one volume of the Memoirs of that Society. The writer of this article, who first suggested the revival of the old figure (and caused it to be employed in Taylor and Walton's five-figure logarithms, in their reprint of孙row's tables, and in his own work on Arithmetic, before any one else had used it) is decidedly of opinion that one more change is yet wanting, the substitution of dull and rather dark paper for the bright and shining material now in general use, which dazzles the eye too much. Tables should not be hot-pressed, and not even pressed at all. The mischiefs of pressure are two-fold; first, the smooth surface thereby created makes the page a kind of mirror, which has a bright image in one place, whereas the rough paper disperses the light equally in all directions; secondly, the other side of the leaf shows through much more after pressure than before. It is also a mistake to suppose that great blackness in the ink, combined with great whiteness in the paper, is favourable to the reader. Every increase of the contrast, over and above what is necessary to perfect legibility, is injurious to it: jet upon snow would in time destroy the strongest eyes. Of all the things which are meant to be read, a black monumental inscription on white marble in a bright light is about the most difficult: one would suppose, to look at our specimens of expensive printing, that such an inscription was the model which it was intended to imitate, and not, if possible, to surpass. We are satisfied, after many trials and comparisons, that a dull paper, of a whithish brown character, too thick to be seen through, and an ink which is of a dull-black, as it were the very deepest shade of the colour of the paper itself, are the things which are permanently agreeable to most eyes. Those who try it should remember that the first page read is not so good a test as the hundredth.

One of the most legible books we know of is the trade edition of Gibbon's Decline and Fall, &c., in twelve volumes octavo, London, 1820. It is considered by the booksellers themselves to be very badly executed. But printers and publishers are too much in the habit of forgetting that a book is a book and not a line engraving. They look at the page as a whole, and if the individual lines stand out and make their separate existence too perceptible, they pronounce it ugly. Accordingly, the uglier the type we are satisfied, after many trials and comparisons, that a dull paper, of a whithish brown character, too thick to be seen through, and an ink which is of a dull-black, as it were the very deepest shade of the colour of the paper itself, are the things which are permanently agreeable to most eyes. Those who try it should remember that the first page read is not so good a test as the hundredth.

§ 1. Tables of Multiplication.—We were wrong in calling the anonymous table, London, 1775, by the name of Riley. That table, which goes up to 10,000 x 10, is Supplementary to Products. London, printed for J. Plummer. But Riley's table, published in the same year, under exactly the same form, is 'Riley's Arithmetical Tables. . . . London, printed for G. Riley. It is imperfect in all the copies we have seen, especially in those in the possession of 5956. The manner of the same form and size as in Plummer, but the headings and lines are different. We suspect that some writer of more than usual research on the quarrals of authors, of some hunter of old injunction cases, might find something about the history of these two books.

Cedat's Table, Paris, 1797, goes to 10,000 x 10; misprinted 1000 x 100 in our article.

Bretschneider, Produkten-Tafel, Hamburg and Gotta, 1841, goes up to 100,000 x 10.

There is a compression of this kind in finding, for example, the multiples of 62873, the reader must look into the page headed 2800, and there, in one part of the page, opposite to (6) 28, he finds the first three figures, and in another part, opposite to 73, the last three figures. The first part belonging to 628 is repeated twice, once for the cases in which the following numbers are less than 50, and once for those in which they are above it; and an asterisk in the last part of the table occurs when it is necessary to add a unit to the preceding figures. This arrangement brings the table into ninety-nine pages octavo, and is very ingenious: but there is more risk of error in using it than we like. Again, multiplying five figures by one is not so difficult an operation that it need be avoided by using a table which is restricted entirely to three distinct things. Lambert's table (1770), presently mentioned, contains the nine multiples of sin x for every degree, to six figures; and multiples of primes to those of 313.

The Munich table, mentioned in our last article, is 1610, J. G. Herwart, Tabulae Arithmeticae Prouencales * Universales, a folio containing all products up to a thousand thousand.

In the Royal Society's Library is a table by J. C. Centnerswerch, Neu erfundene Multiplications und Quadrat-Tafeln, Berlin, 1825. The earliest table we have seen mentioned is the one given by John Bernoulli (younger), Sexcentenary Table, London, 1779, and Michael Taylor's Sexagonal Table, London, 1786, intended to have the use of logistic logarithms, the former for the first term, and the latter 1°. Both were published by the Admiralty.

§ 2. Tables of division and of prime numbers.—Chenuac's table gives not merely the lowest divisor as stated, but every divisor, for all the numbers under 100000 which are not divisible by 2, 3, or 5. It is accordingly a (larger) and we think a more useful) work than that of Burkhart.

Branker's translation of Rhobinius, mentioned in our preceding article, is of London, 1668, much altered and augmented by D. P.; this D. P. is Dr. Pell. The table of primes, &c. to 100000 is computed under Pell's advice and direction. But there are several places the title of a work of Poll which we have never seen, and which we take from Lepinius: Tabula decem millium difficilium Numerorum, ex uno numero omnium quinque ad centum millium (mile habent difficulitates), English, London, folio, 1666. This looks like a table of prime numbers, and the number of primes under a hundred thousand is about ten thousand. But we must leave it to those who can see the work, if it still exist. Branker's table was reprinted in the

Murhavd mentions the first part of a table (by A. Felkel) of the factors of all numbers not divisible by 2, 3, or 5, from 1 to a hundred million, Venice, 1776. We presume if this work had got as far as either Burkhart or Chermac, we should have heard of it.

§ 3. Tables of squares, cubes, square roots, cube roots, and powers in general. — Perhaps the oldest printed table of squares is that in p. 80 of Pacioli's Summa, &c. [VII, p. C., p. 813; printed in 1494 and again in 1528, which however go very different numbers. — Do in modo di misurare de Distante, &c., Venice, 1564, has squares up to 661. — Magini's 'Tabula Tetragonica,' Venice, 1592, is not a separate work, but a chapter in his work on the planet, the preces numeri give squares up to 10100, but not cubes. It was however published separately, at the same time as the work on triangles, as well as in it: the only difference being that the separate publication has its headings and explanations Italian instead of Latin. The number of so-called books, which are only chapters of other books, is large enough to make a big catalogue.

Lipsius mentions 'Tabulae numerorum quadratorium decies milliomi,' London, 1672, which is Fall's table, though it has not his name. It has also an English title, contains the first ten thousand squares, and also the number of pairs, triads, and quadruplets (in number of figures) with which a square does not finish. Henricus, 'Arithmetica,' Augsburg, 1609, begins with squares and cubes of all numbers up to 360. Hullbronn (p. 627) mentions a tabula Cribiana which gives squares up to 10000000. But for powers of 2, up to 712 power, there are given various tables. John Hill's Arithmetic, of which the seventh edition bears London, 1749, has all the powers of 2, up to the 144th, for the purpose of solving questions about chessboards and horsemen-nails. We also have the title G. C. Sartorius, 'Cubicis tabellae,' Eisenach, 1827.

Maerces, at the end of the tracts on Combinations, London, 1795, has reprinted Hutton's square roots (1)100 to ten decimals, and reciprocals to seven. We believe that Hutton first gave them in his 'Miscellaneous Mathematica,' 4 vols. 12mo. 1775. In Jonas Moore's Arithmetic, 1650, there are the squares and cubes of all numbers up to 1000, the fourth powers up to 306, and the fifth and sixth up to 200. These were reprinted in the edition of 1660.

Roggen mentions 'Art gants neem-teckte,' &c. Desauw, 1755, 8vo., containing the cubes of all numbers up to 100,000, or at least professed in the title-page to give the cube root of every number under a thousand millions of millions: perhaps the cubes went to that of 10,000, with a rule for the fifth figure. And here we may mention that we have been several times in error in our little table giving the extent of large tables, as it ought to do, but the extent which to operations of interpolation will be effective.

§ 4. Pure Decimal Operations. — An anonymous work, 'Tabulae numerorum decimorum, &c.' London, 1622, gives every fraction less than unity whose denominator does not exceed three figures, nor its numerator two, to seven places of decimals. This is a useful table. We may also mention (but not as having seen it) W. F. Wucherer, 'Beyer's zum allgemeinen Gebrauch der Dezimalbruchrechnung,' &c.Karlsruhe, 1795, 8vo.

The oldest table we have found printed in English is in this booke sheweth the maner of measurage of all manner of lande, as well of woodlande, as of lande in the feld, and compting the true number of acres of the same. Newie invented and compiled by Syr Rycharde Benecen Chason of Meesnor in Normando London. Printed in Southwark in Saynt Thomas his hospital by me James Nicolson. There is no date, but Nicolson's dated works run from 1538 to 1558. There is another edition (which omits the tables) printed by Thomas in 1591, and a postscript dated from 1548 to 1575. There are two double-entry tables of the rudest character, for finding the number of acres in a given length and breadth, and for casting up payment at per perch, per acre, &c.

§ 5. A table of the products of numbers; the first part of a bibliographical history of the early part of this subject is so incorrectly given, as well as ambiguously, even by the best authorities, that it will be worth while to collect the several heads, distinguishing the true from the false, and from what we are obliged to take from other sources, putting the name of an authority (of which we have usually two or three) to the latter. Much confusion has arisen from the double meaning of the word publication in the century

following the invention of printing, when it was applied equally to the issue of a printed book and of a manuscript. We are here concerned with the former sense, and it is sometimes difficult to distinguish between the two.

That Albrechtinus [P. C. S.] had substituted sines for Ptolomy's chords,—that he had also used versed sines and tangents,—that he had finished and Regiomontanus's table of chords (issued (in manuscript at least) tables of sines to two separate radical, 6,000,000, and 10,000,000—are historical facts of notoriety. Our question is, what tables were first printed? On the books which Regiomontanus's [Albrechtinus?] hand passed to posterity, and the long list of those which he published and intended to publish (as set forth in his own 'Index Operum, &c.' printed at Nürnberg by himself, his historians, Doppelmayner, Dr. Dürer, W. W., and others) we cannot speak with certainty. We are at variance. In the vague manner in which books and their contents are frequently described by professedly mathematical writers, a good resource is often found in the catalogues of general bibliographers.

The 'Tabulæ Directionum and functionarum' of Regiomontanus were published by himself at Nürnberg (without date, probably about 1476), and were reprinted at Venice in 1485. But we cannot ascertain that either of these contained tables of sines. But Hain (Repart. Bibliogr.), who gives their titles, gives that of the next edition (Augsburg, Ehr. Ratdolt, 1490, &to.) in a fuller manner: from which it appears that there is appended to it a table of sines (mentioned in it), and that Regiomontanus had not given such a table in the former edition: they are, 'Tabella Sinus recti: per gradus et singula minutæ dividit. Ad Tabulæ Directionum Mag. Joh. de Regiomontano, quattuor novem minutæ dividit. This table does not belong to the work, since it follows even the printer's insinuation. Hain also met with it as a separate work; being, as appears from its description in the lisionis, pages, &c. absolutely the same as that which was appended to the Tabulæ Directionum. Accordingly, until something earlier or more definite is produced, we must say that the first known printed table of sines is an anonymous table, to minutes, printed in a quart. date, of 1560, stated (falsely necessaria when it ought to be necessaria) to be necessary to the tables of Regiomontanus, and implying that sines had not then been printed with those tables. From the next-mentioned edition of the Tabulæ Directionum (this we have seen) we should supposes that these tables were to a radius of 600,000, as in that edition, which is of Venice, 1564, 4to. In it we find a minute-table of sines, headed 'Incipit tabella sinus recti,' and with a column containing the differences of the sine. Delambre and others mention Regiomontanus as having given the first tables of tangents in this work under the name of tabula facunda. It is in the edition of 1465, and was reprinted in 1587. It is a table of sines printed with the index; &c. and of sine nomico, Antwerp, 1645. It is to degrees only, and to a radius 100,000, and is a table of cotangents, not of tangents. Delambre mentions an edition of the work, edited by Gaulisius, in 1602, and Nürnberg, 1642, printed out of 13 minutes of this we can find nothing. As yet we have no sines calculated to the new ordinary radius of 10,000, &c. Of these the earliest that we have seen (and we find no earlier ones mentioned) are those of Peter Apian in the 'Instrumentum Geographica, &c.' Ingolstadt, 1533, folio. They are minute-tables to a radius of 100,000, and were reprinted next year in the same author's 'Instrumenum primi Mobilis,' Nürnberg, 1534, folio. Apian states that they are of his own calculation, and this is to us a strong presumption that no such tables had been previously printed; for Apian was a great reprinter of the writings of others at his own press, and very unlikely to have recalculated any table which he knew to exist already. The statement that the work of Regiomontanus on triangles (Nürnberg, 1583, folio) contains tables of sines, is incorrect: we know it from examination of two perfect copies. As we are now contradicting our own previous assertion ['History of Mathematics, P. C. J.'], we will point out how we were misled. Lalande (Bibl. Astron.) says that the first edition of the work, Basle, 1538, has in the title-page 'una cum tabulis sinus.' Now the fact is the tables, who had only, 'Basilea,' no date, known to be of 1561, which does contain tables of sines, took the liberty of presensing that the first edition was the same in contents, title, and place; in all of which he knew itself to be mistaken.

In 1542, Rheticus, the most laborious of all the table computors, made his first appearance as the editor of a work of Copernicus: 'De Lateribus et Angulis Triangulorum,' &c., Wittemberg, 4to. (Weider and Ritter). This contains a
minute-table of sines to a radius of ten millions, being the first-
published seven-figure table. The table which appeared in the
same year, and was by Coicis, P.C., is an abridgment of the preceding; going only to
every ten minutes, and to a radius of 100,000.

In 1641 appeared one of the tables which have obtained
most credit. This is the sixth, and last, of the super-
propositiones Ptolemeii de Sinibus et Cordis, item composition
Tablearum Sinuum per Joannem de Regiomontano. Adjecte
Tabulae Sinuum duplices per eundem Regiomontanum, Nürnberg
1541, folio (Kasnetz, etc.). The two tables of sines are both minute-tables, with radii of 6 millions and of
10 millions. The table of tangents to every degree is repeated
again under the name of tabula facunda.

It has been described in the route of analogy, which suggested to him the formation of a table giving
the ratios which exist between the sides of a right-angled
triangle: by which he was led to the invention of what were
afterwards called sines, to the completion of the trigonomo-
tical canon, and to its arrangement in the form which it has
ever since preserved. His rights in this matter have long
been forgotten; and it is only very recently indeed that the work
which established them has received any notice in modern
times. (See the Notices of the Astron. Soc., vol. vi.
p. 213, and Phil. Mag., June, 1845.) In 1651, the year
following in which he was placed in the Index as a for-
bidden book, he published his book of 'Trigonometrica,' Leipzig,
1640. This is a complete canon to every ten
minutes, and to a radius of 10 millions (or, as we should now
say, to seven decimals) with differences, so arranged that the
resultant errors are on the whole very small, and given in
such a manner as to make it possible for anyone to use the
sheets with facility. This arrangement may be called semi-
quadrantal, as opposed to the older quadrantal arrangement
in which the sines are carried directly from 0 of the Arc.
Accordingly the page of Rheticus has both a head and foot de-
scription, as in modern tables. So completely is he bent on
the idea of a register of the proportions of right-angled
triangles, that he rejects any trigonometrical tables for
the world at large. In his place of the sine and cosine, he has the
perpendicular and base to an hypotenuse of ten millions; in that of the
tangent and secant he has the perpendicular and hypotenuse to a
base of ten millions; in that of the cotangent and cosecant,
he has the base and hypotenuse to a perpendicular of
ten millions.

The same description is adopted in his larger work,
which we shall presently speak.

In 1658 (Delambre) Maurolycus published his edition
of Theodosius, Menelacus, etc. (Messana, 1440), containing
the three tables, that of sines, the tabula facunda, and the tabula
beneficia (as he called the present table of sines). This
table goes only to degrees (except that tangents and secants
0 which were given for 15, 30, 45, 55, and 65 minutes of the last
degree of the quadrant) and is to a radius of 100,000.

Delambre, etc., suppose that these are the first tables of sines which were published, and accordingly attribute the in-
vention to Maurolycus. But we have seen that it is due to
Rheticus and Finck (presently mentioned), who lived close
to these times, states expressly that Maurolycus borrowed
this table from Rheticus.

In 1662 a pupil of Rheticus published a table of sines
to every minute, and to a radius of ten millions. This was
Samuel Eisenmenger (or Siderocrates, as he wrote himself),
in 1660. It is very large, and he was not a copy in the library.

It was, as we find stated in various quarters, a table of sines
in the work on dialling of Hermann Witekind, 'Conformatio
Herculis' which the first edition is said to be of
Heidelberg, 1576, 4to.

The first complete canon to every minute (that of Rheticus
in 1651 being to every ten minutes) was Vieta's 'Canon
Trigonometricus,' published at Adelphi, Paris, 1769, 4to.
We have described this work in the 'Vieta, P. C.,
p. 816, and shall here only make a few additions. Besides the
three title-pages there mentioned, there must have been a
fourth; for in the title of that which Delambre examined
was the motto Durae et quiesust, which is common not
in either of the three seen by us. The work has well obeyed
the direction given: it has lasted in silence, having never
seen other copies or his sines till modern times.

Copies seem to have been rare in Germany; neither Weidler,
Heilbronner, nor Kastner mentions it. Hutton never saw
but his own copy; Montuela (in France!) never saw more than
two, in one of the royal library, and one sold at the
Bouibise sale (but it is not in the catalogue of that sale),
which the historian would fain have bought, but had a curiosi-
ty bid too high.

And this was by the time Montuela's second edition was
written, for by the mention of it made in the first
dition it is clear that the author had never seen it. We have ex-
aminated in London at least eight copies. We have mentioned
(Vieta, P. C.) the complaints which the author had to make
against the printer. The author states that he bought in
many as he could. There are several signs of something odd
having taken place in the printing: and the following is worth men-
tion:—To one of the copies we have seen (as well
as to one of the two that we bought), the printer's
sheet, in correction of a mass of errors in one sheet of the
collection of formulae: this is a separate publication, with the
date (1759) and printer's name on it.

Vieta imitates Rheticus in his method of leading the tables,
but in addition uses the word sine, and calls the table of
tangents facunda, and that of secants facundissima.

He complains that elegant names have not been found, and states
that he gets his denominations from certain tables which
he calls them; it is not often that mathematical tabulators are
called rhapsodists) whom he does not name. In a later work,
the Responsa, etc. (Vieta, P. C., p. 318), published in
1658, he names and objects to the words tangent and secant,
which by that time he had seen. And he proposes to call
the tangents ponsines or oamines, and the secants transversal
lines.

As to the matter of Vieta's tables, it is worth notice
that they must have been made by independent calculation. They
do not exhibit the errors in the last tangents and secants
which appear in all writings prior to the more correct publication
of the French labourers after 1640. It is in the application of the
theory of trigonometry we have not here to speak: we
may simply say that they made the computation of a trigono-
metrical canon a much easier thing than it had theretofore
been. Delambre, etc., declare that this is due to
'Trigonometria Britannica' of Briggs is altogether French in
all that relates to the non-logarithmic part of it. Had he
knew a little more of Vieta, he could have reinforced his
assertion. For the method of solving equations which he
describes (evidently not understanding it) as an obscure
mixture of division and extraction of roots, was the slightly
amended form of Vieta's numerical exegesis, to which we
have referred in EVOLUTION AND EVOLUTION, P. C.,
104. And as, by Gellibrand's account, we trace the com-
merce of Briggs's labours to shortly after the time when
Vieta first published this exegesis, it is by no means an
unlikely conclusion that the power of trisection and quinquese-
tion given by this mode of solving equations, first put it into
his head to construct the table.

Furbach and Regiomontanus had seen the advantage of
adopting decimal tables, though their use of a radius of 600,
which was a remnant of sexagesimalism. It was reserved for
Maurice Breesius to show himself a century behind his time,
by publishing in his 'Metrices Astronomicae Libri Quatuor,'
Paris, 1651, folio, to four places, and in the form of

tables, tangents, and secants, or as he calls them, sines, adscriptes,
and hypothecates. Thus, the radius being 60°, the sine
of 65° 26' is given as 50° 30' 34"; and the adscript and hy-
thecate as 154° 30' 34". Thus, in the sex, meaning 60°.

Accustomed as we are to look upon sex-
gesimal division as sacred to angular and horary measure, we
are apt to forget that the time was when other subdivisions
were rarely used in Europe.
As yet we do not find the modern names of tangens and secund. These were introduced in 1598 by a young man of twenty-two, a lawyer, Thomas Fleet, in his 'Geometricam Rotundi Liber XIV.', Basle, 4to. His part in the matter was quite forgotten, and has been recently revived (see Phil. Mag., May, 1846). He introduces the word with the greatest brevity, and in a way which in other matters would have been judged otherwise than as a proposal of his own, to which it must be added that no earlier use of these words has ever been brought forward. The tables of sines, tangents, and secants, so called, which Fleet published every minute, and to a radius of 10 million. Finck deserves a much higher name than he has got, for the contents of this work alone: there are other writings of his, which we have not seen. He calculated his own secants by a theorem which answers to the formula

\[ \sec \theta = \tan \theta + \tan \left(45^\circ - \frac{\theta}{2}\right). \]

In 1595-6 Clavius published at Rome, in quarto, his edition of Theodosius, to which is appended a treatise on triangles, and a table of sines, tangents, and secants, under those names. They were reprinted in the folio collection of his works, Mayence, 1611. It is clear, on inspection, that these tables are, as far as tangents and secants are concerned, a reprint of those of Finck, in their preliminary theorems, in their arrangement, in their omissions, and in their errors, as well as in the new terms with which they are headed. The names however are as well as we know, not those of Theodosius; both them were Protestants, and Clavius was a Jesuit, high in favour at Rome. Delambre expresses his astonishment that Clavius, in recaptitulating the names of celebrated writers on dialling, should not have used those of Sebastian Münster. The fact was, that Münster followed Luther. We are not quite certain that a greater than Clavius was altogether exempt from thisLaughable weakness. When Vieta suppresses the names of his author, as above noted, calling them merely rhopadoetis, we may almost suspect that he wanted to avoid speaking of Hetricus and Reinhold; for he was very intolerant.

In 1591, Philip Lansberg published 'Triangulorum Geometricarum' Leyden, and in 1602, mint, published 'De Planis Triangulis Liber Unicus,' Venice, 4to. Both these are copied from Clavius: but Magini at least, who goes beyond Clavius in historical reference, willfully supposes the name of Finck.

We at first thought ourselves unable to give a date to the tables of Stevinus, except within a few years, and conjecturally. That he published his Arithmetica in 1585, and that Snell collected his works in Latin in 1605-8, are the facts which are supposed to mark out the known limits of his career. The tables must have been published in 1599, since Vieta's names for the tangent and secant are used; probably, for Vieta's works were of very slow travel. We ourselves believe fully that the Coeometrica, which contains the tables, was published long before it appeared in what is called Snell's collection (in 1608). These tables go to every minute, to a radius of 10 millions, and they are copies of Finck, Clavius, &c. We are informed that recent researches in Belchuan, hitherto, have made it appear that Stevinus was born in 1548, and died in 1620, which puts our opinion beyond dispute.

The mistake about Snell seems to have originated with Gerard Vossius.

In 1588, Nic. Raymar, Ursus Dithmarus, published 'Fundamentum Astronomicum, id est nova Doctrina Sinum,' &c., Strasburg. We cannot make out from the descriptions, whether this work contains tables or not: probably it did.

Who published 'The First English Trigonometrical Table is a point which we have never examined: and we must investigate it in the best way we can from rather scanty materials. We cannot find the word sine mentioned in the works of these (indeed, all the trigonometrical works of either Digges, father or son, or in those of John Dee; nor indeed in any work written in English before Blundeville, except that of Burroughs presently cited. In the 'Alme, seu Catholicae, Thomas Digges, London, 1573, 4to., trigonometrical processes are recorded for which allusion may be made: but it cannot be shown that these were ever applied to the collection of the data. Similarly, Snell, the re-edited edition, was only seventeen years old when the work was published.

The invention is made to Copernicus and Regiomontanus, and the tables of Rheticus are often cited (the ten-minute canon, of 1551). In John Dee's 'Paracentesis Complementi Pro- cæsque Nucleus quidam,' London, 1578, 4to., there are also solutions of triangles, and the tables referred to are those of Regiomontanus with the radius 90,000, before mentioned. But neither of these writers made any reference to any tables published in England. We have examined the libraries of more than one diligent collector of English works of the sixteenth century, without finding anything which at all corresponds, published in England, or even printed in the real inquirer of a complete canon of sines, tangents, and secants.

Blundeville 's 'Exercises,' London, 1594, 4to. (It is said sometimes that 1597 is the date of the first edition, but incorrectly, were commenced, as he informs us, about seven years before. He alludes to Regiomontanus, Copernicus, and Clavius, whom he took as a guide. And he informs us that Regiomontanus is in folio, and that Clavius is in quarto, and published in England, at Rome. We rely much on this in our conclusion that his was the first table: for to mention the form of a book, or the date of publication, is very rare with the writers of his time; and it is most likely that so precise a person would have noticed any previous work of the same kind in his own country. The tables, being copies of Clavius, have almost exactly the same form as those described. It is only that through seven editions at least: the seventh, now before us, has the tables corrected from Pitiscus, by Robert Hartwell, the editor; it is London, 1636, 4to.

It may be supposed, however, that though Blundeville gave the first English canon complete, a table of sines only had been printed four years before. It is at the end of the 'Horo-logiographia, the art of Dialling' by Thomas Fale, London, 1598, 4to. (reprinted in 1599). The sines are to minutes, with a radius of 100,000. This then is the earliest table, but it is of sines only. We have seen that Diggès used sines, but he is a Latin writer, and refers to a foreign table. Perhaps the first writer who used them in English (but still with foreign tables) is the well-known W. Burroughs, in his 'Discourse on the Variations of the Compass,' published in 1581. In the preface he apologizes for introducing rules 'wrought by the English, and sines and triangles wherein they seem strange in our English Tongue,' and he all gives on tables is in the following passage:-- In these examples I have used the abridged table of 100,000 the whole sines, which though it give some ease in the working, yet it is not so exact as that of 10,000,000 of Erasmus Reinholdius. Upto the which, with his Canon fiscundus, answerable to the same, the third Canon of the Hypotheneuses were annexed, we should have an entire Table of Sin, Tangents, and Secants, and a Table of the Table of Tables. This thing, though Georgius Joachimi Rheticus have well begun, and framed it orderly, from ten Minutes to ten: yet is it left very rawy, for such a Table, as the exacte truth of Geometry, and of the precise cause of the plan of the world, which we do not find it easy to use:-- Now let us publish it for the commodite of all such as shall have occasion to use the same for navigatiion and cosmographic. But this table was never published, and accordingly the editor of the edition of 1614 refers the reader to Ralph Handsom's translation of Pitiscus, and the very tables of that work are annexed to the end of the edition of 1614. They are tables to every minute, and to a radius of 100,000. We cannot describe the first edition of Handsom's work, having only seen the second, which is London, 1630, quarto. (Wilson, in the preface to his Navigation, says it was in 1614.) In 1609, John Speidel, afterwards well known in the world of logarithms, began his career by publishing, amongst other things, contains veri necesarie and profitable Tables: viz. A Table of Sines, Tangents, and Secants, &c.' This tract of sixteen pages contains a canon to every ten minutes, and to a radius 1000, with some tables subsidiary astronomy.

In 1610, Arthur Hopton published 'Daculum Geaetasticum, sive Viaticum, or the Geocentrical Sufe.' London, 4to. The seventh book of this is called 'Trigonometria, containing longitudes, latitudes, and other parts of the science, reduced by gallon, with a Canon for the Dimension of trangles.' The canon (from Pitiscus) is complete for every five minutes and

* This is the same as the Blundeville who wrote on Homemanship. A few months ago (it is now October, 1646) a paper was kept in the library, upon proof that Blundeville had described it before 1600.
The rest of the French savans (to whom the subject was particularly interesting, on account of its connection with the
Tables du Cadastre, then preparing) miswere equally interested in the
reception, which might be expected to appear on the separate title-page of the
communefacio. The person who is used to accurate
descriptions of books might possibly, without this warning,
throw away the thin folio we are speaking of, under the idea that it could not be of much importance. The Opus Palatinum: which in fact it is not, though it is an edition of all that was corrected. The 86 pages of reprint are easily distinguishable from the inferiority of paper and type.* The
title-page of the third edition is a sort of octavo...the first page, as follows:—Georgii Joachimi Rhetici
magnum canonum doctrinâ triangulârâ ad decadas secundârum ac praegressâm ad
edicationem de magnis in aliorum codicibus, etc. Recens emendatus a Bartholomei Pictaco Silesio...addita est brevis commonofficio de fabrice et usu ujus Canônica...Canon
bice, una cum brevi commoffacio...etiam separárum ab oppere Palatino renditor. In bibliopoleo Harnichiano. And the commonofficio has a title-page of its own, as follows:—Bartholomei Pictaci Grünbergensii Silesii brevis Perspicâc comunefacio de fabrice et usu magni canônica
doctriinae triangulâriuâ. Exguamni Georgii Joachimii Retici. Necedit Typis Nicolai Schrämeli MDCVII. It thus appears that the date is 1607, which no one has yet noted, except
Kastner, copying an older description, apparently without any distinct separato knowledge of what he was describing. Pictaci published, Frankfort, 1613 (misprinted on two of the
titles 1518, by omission of a C) the folios of the tables of Rhetici by
which himself was enabled to make the preceding corrections, under a long dedication prefixed, as follows:
 Mathematica. The contents, described in modern language, are:—sines to every ten seconds and to fifteen decimals, with first, second, third, and sometimes more demands; those of
the first and last degrees, also to fifteen places, and to every second; the fundamental sines, from which the rest
were calculated, to twenty places: the sines of every 10th, 30th, and 50th second in the first 35 minutes to 22 places (this last table was done by Pictaci himself). Died in July, 1618, very shortly after the publication of the Theatrum.

When we come to reflect, we find that the tables of Rhetici did not make such an epoch in the history of these
things as might have been expected. The ten-minute canôn (1615) which we have described, and of which the memory
was almost lost, introduced the sines, completed the system, and
suggested to Vietâ both the extension and its form. Had Rhetici published his own large table in 1576, it might have been otherwise: but deferred as this publication
was, partly till 1596, seventeen years after Vietâ's Canon had appeared, and partly till 1613, the year before the
first edition of his Theatrum, it turned out that the tables of Pictaci had already been given from other quarters. The next great tables of sines which were produced were the work of Briggs, who
was, as we have seen, exclusively the follower of Vietâ in this part of the business. Briggs was a little more than a tradition, though Vlacq used the last half
of his quadrant in the construction of logarithmic sines. Vossius (1650) knew nothing definite of the tables except the
Thesaurus, and that only in time to insert it in the additions to his work. Sherburne (1675) has not a word of tables. Briggs hardly mentions Rhetici; his biographers not at all. The Jesuit Blancanus omits him as a condemned writer; and it is to be noticed that he was, as to this matter, worse off than Opertiuss himself; and the absolute prohibition against all his writings must have tended to the oblivion into which his name fell. Weidler (1741), writing in the University of Wittenberg, in which Rhetici taught, had not seen the
Opus Palatinum, and knew nothing of what Pictaci had

* The corrected copies of the work, thick or thin, may be distinguished from the uncorrected ones, as follows:—the corrected copies at the running titles of the columns. The uncorrected copy will have, as it ought to have,

Basis Differentia Hypothema

But the corrected copy is not so read like the uncorrected, as to have, it as ought to have,

Hypothema Differentia Basis

† The copies of the two works, the Opus Palatinum, and the Theatrum, which belonged to Delambre, were bought at the sale of his books by Mr. Bagage. The copy of the Theatrum is complete; it is followed by the

Thesaurus, and was bequeathed to Delambre by Lalande. It sold at the sale of the

To where the following place of seven

Dhântom, and the title-page of the

Theatrum (the thin column). He informs me, that in 1828, Reuss, the librarian

imperial archives of Stettinum, and the editor of the Leiden, and the

Theatrum, the most complete digest of scientific transactions which

Theatrum, was altogether cut out, and the rest—nothing but what we know of

Theatrum. This is a truly singular instance of the stoicism with which bibliographical information agrees.

** Weidler, copied by Montalca, given Heidelberg, 1694; and Lalande requests us by taking Neuntzold to be Latin for Heidelberg. The New

stedt here mentioned is now part of Breslau, lat. 49° 40', long. 11°...
done. In the Berlin Memoirs for 1786, John Bernoulli (the younger) revived the knowledge of the Opus Palatinum and the Thesaurus of J. L. Rheticus. It had previously come to some statement to the effect that Pitcicus had once received instructions to correct the former. But Bernoulli knew nothing of these corrections, and nothing was known until chance threw a copy of it in the Palatinum in the possession of the late Dr. Brown, who described it in a paper printed in the fifth volume of the Memoirs of the Institute (1804). Delambre gave an accurate account at the beginning of the second volume of the History of Astronomy that Pitcicus had given another account of all the matter, except the corrections of the Opus Palatinum, on which he could only quote from a periodical of 1789.

In 1859 Pitcicus published his own work on Trigonometry, with tables, generally to seven places, and having intervals which may be described in the notation of our former paper as \( \frac{1}{10^{7}} \) (2\( \sqrt{2} \)) \( \frac{1}{10^{10}} \) \( \frac{1}{10^{15}} \) (4\( \sqrt{10} \)).

The edition of 1866, now before us, has of course the corrected tangents and secants. It was reprinted again in 1812, and Dechales mentions a reprint, by Henricus, in 1823.

Pitcicus will always be remembered as the priest who wished that all his brethren were mathematicians,* to make them moral, cold, and benevolent.

Among the non-logarithmic tables, which were published after the invention of Napier turned all the calculators another way, we have mentioned in our former article Schlooten's Table, Amsterdam, 1677, logarithms for the sine of a quadrant. It was followed in 1653 (?) and we know there is an edition of 1672 at Rouen, and of 1683 at Brussels. Editions are mentioned of 1640 and 1664, and also a Spanish edition, Brussels, 1688. John Mytich's Table, Strasbourg, 1602, contain sines, tangents, secants, and tangents and secants, squares, and cubes. Those of Adrian Metius, 1673, give a complete canon, to minutes, to seven decimals. In 1677 Snell published his 'Logarithmianum canonum,' Leyden, containing a complete canon to every minute, and to seven places. Cruger's 'Synopsis Trigonometrica,' Danzig, 1612, gave a five-decimal canon, to minutes. Albert Girard 'Tables des sinus,' i.e. Hague, 1645, had five decimals; there was a Dutch reprint in 1629. Adrian Romanus gave tables (Delambre, Astr. Mod., vol. ii. p. 35) in 1699; they were taken from Clavius. The contents of this paragraph are taken from different sources, and not from the books themselves. We might mention some anonymous tables from various catalogues, but anonymous works of this kind are so rare that we always suspect them.

Austria (1649), the earliest work which has bulk enough to be compared with modern works of the same name, gives nothing more than a canon to degrees and seven decimals, with another to ten minutes and five decimals. The name only of logarithms is mentioned, and an insufficient definition given.

§ 6. We shall now add something to our account of logarithm tables, including a fuller description of a few of those mentioned in our former article. The date and name, where unaccompanied by a title, will serve as a reference to that article.

1614. Napier. It must be specially noted that the logarithms which Napier himself published are not precisely those which are now called Napierian; that is, they are not the simple logarithms to the base \(2.7182818\). As the sines increase, his logarithms decrease. As he uses no decimal point, both his sines and logarithms are integers, the former to a radius of 10 millions. And if \(N\) be a sine and \(L\) the logarithm of it, as they stand in Napier, the equation connecting them is

\[ L = \log_{2.7182818}(N) \]

Delambre proposes to call them Napierian logarithms, and to resolve them into hyperbolic to the modern Napierian or \(2.7182818\) logarithms.

1618. Benjamin Ursinus. The Magnus Canon, besides

* In his preface he says, 'Mansuetudo aetem, bonae Dei, quantum et quam rerum et theologiorum crescentiis! Et quam opacatum est sectae, qua tempora, quae sunt, aetatera, quae futura sunt.' Perhaps the union of the characters of divine and mathematician gives a positive impulse to speak well of the latter, the latter often, in fact, stolid and solemn, and at most, pedantissimum (philosophi) mathematicorum genuinum est mathematicorum. We accept the et alia, for there is no saying how the modern mathematicians might transcribe the first epitaph.

1619. John Speidel. These 'New Logarithms' are the first modern Napierian, or hyperbolic logarithms. The second edition was in 1620, not 1621, as we stated (from others) before we had seen it. The third edition, which was prefixed to it, bears the title-page.

Taking decimals it stands thus—If \(a\) be the sine of an angle, and \(L\) the logarithm to the base 2.7182818 of \(a\), the figures of the Napierian logarithm are found in

\[ a = e^{x} \]

Thus, the sine of 19° 38' is 0.356, very nearly. And we have

\[ \log_{2.7182818}(a) = 0.356 \]
by Montucla, and the history of the book is as follows:

Kepler had stated that Byrgius had invented the very same logarithm as Napier many years before the latter published and that he, Kepler, had informed the author of "Mässen" of his work on perspective (Casels, 1630), says that his brother-in-law and teacher, Justus Byrgius, had, twenty years before that time, made a table of progressions with differences of 10, called a "Mässen", in the Dutch language! This text is quoted in Montucla's history, as reprinted by Rechenkunst," (1783) that this passage of Brummer had led him to look at some old tables which he had bought, and which had lain by neglect. And in these old tables he found that he had certainly the same


See a very full account of them also in the first volume of Delambre's History of Modern Astronomy.

1625. Wingate. "Arithmetique Logarithmique." Under this head, in our last article, we mentioned the difficulty about the date of the book by which Wingate introduced Briggs's logarithms into France. We have since found a copy dated 1625, and we are satisfied, from the date of the "privilegium," that it was printed in 1625. This date is November 4, 1625, and the printing is stated as having been finished April 1, 1625. This edition and that of 1626 are from the same type, except in their title-pages, and a page followed by a paragraph most likely that now printed in 1626, but it is not seen after a further appendix on some points of explanation. It has also additional (perhaps, for the same thing may have been torn out of our copy of 1626) a folding sheet of mean proportional between 10 and 1. The contents are, seven-decimal logarithms of numbers 0(1)10000 with intertext differences; and 0(1)45° logarithms of sines and tangents. This is the introduction of Briggs's logarithms into France; that of Napier was made, as noted, by B. Vincent. But the dates should have been 1619 for the Descriptio, and 1620 for the Constructio.

1626. Henric. In our former article we left this work in doubt. All Delambre gives is from Dechales, who states that Henric wrote on the proportional compasses in 1623 (reprinted in 1818) and on the rule of proportion (which we take to be Guntor's scale) in 1626; and that this last work contains seven-decimal logarithms of numbers from 1 to 10,000,000, composed by Henry Briggs. A Goude. Par Pierre Rammasen. The negligence of a book-binder enables us here to turn up a third or two of our former articles, in a rather singular manner. It will be seen that we have (p. 498) noted Sherwin as stating that he examined his table by one of Vlacq's, in large octavo, printed at Gouda in 1626, of which table we find the number of the tenor, which corresponds in every respect, except that there is no author's name: but one except Vlacq can be mentioned, who was in the least likely to have printed logarithms at Gouda or in about 1626. And we have no doubt is the real first edition of the series of small logarithms called Vlacq's, which will occur several times in our list. Again (p. 498) in speaking of Gellibrand's "Institution Trigonometria," we have noted the table as being from W. Speult, which W. had seen, and which seemed to resemble the description of Gellibrand's tables, which we had not. Now this table, Gouda, 1626, having the title above described (and which we have also seen with the Dutch title and preface), to the table which is always bound up at the end of "Scicographia, or art of Shadowes ... by T. W., Esq., London, 1635, large octavo. That the book was intended to have these logarithms bound in it, and that the book was very rare, we have no title to the logarithms, which look quite like part of the work. But in some copies the binder has not cancelled as required; we have obtained two (since our first article was written) and there is another in the Library of the Royal Society. But in all three copies the title of the logarithms is cut half way up with knife or scissors, as a direction to the binder to cancel it. One of our copies of this Dutch title-page to the tables "Henrici Briggsi Tafel van Logarithmi voor de Ghetallen van een tot 10000. Ter Goude ... 1626.' And the work (though the same impression as before) has a different page, namely "Hendrici Briggsi Tafel ... by T. Wells of Deptford, Esq., London, 1687."

This first edition of Vlacq (1626), as we will call it (being certainly the first small table published under Vlacq's name), contains logarithms to ten decimals; and a complete canon of (logarithms only) to ten decimals and to seven decimals. But the terms cosine, cotangent, co-

1630. Bartusch. The tables which Bartusch published independently of his father-in-law (Kepler) had fallen into oblivion, when Eisenmich found a copy and republished them with Kepler's last tables under the title of "Joh. Keplcr et Jacobi Bartuschii Tabulae mensurae logarithmicae," Strasburg, 1710, 12mo. What the titles and dates of the original works were, we can find only from Lepinus, who gives them as follows:


Whether the first or an original edition do we not know: if so, it was posthumous. The reprint by Eisenmich contains, according to Delambre (Astr. Mod. l. 590), "Naperian logarithms of sines and tangents to ten seconds, but only to five minutes. The reason is that we now (since the first edition) now call logicarithmetic for every second of the first degree, 1° being the first term of the proportion. It is to six figures.

1630. J. Faulhaber, "Ingeniur-schul, Erster Theil," Frankfurt. This work contains logarithms, according to Scheibcl, who does not give a description.

*Women* the first edition of Smarit's tables, hereinafter mentioned, while seems to be wholly unknown to all the modern writers on logarithms. 4, 11.
1833. J. F. Gleditsch, 'Des vollständigen Mathematische Lexiz sweyter Theil,' Leipzig. Here we have squares and right-angled triangles, numbers of signs and targentos 0(1)45°; hyperbolic logarithms, of numbers 0(1)20000; signs, targentos, and secants 0(1)45° to seven decimals; factors of odd numbers not ending with 5, to 10,000.

1843. Cruger, 'Kästner gives Dantzig as the place. The logarithms are Napierian, according to him. 1851. Wing, 'Harmonic Coeleste,' London. The logarithms have separate title-pages, and might, if torn out, pass for separate works. They have the decimal point and are to six decimal places. Signs and targentos 0(1)45° and 0(1)10000, without characteristics. Wing was a much more learned man than his reputation (which is that of an almanac-maker) would imply.

1868. John Newton, 'The Scale of Interest, or the use of Decimal Logarithms.' There is a table of sign and tantages 0(1)10000 arranged in lines of decade, with a separate table of proportional parts.

1863. Vlaqc, 'Table de Sinus, &c.,' Amsterdam. A great many small tables of logarithms bear the name of Adrian Vlaqc. Those before us, which have the same introduction, one in Latin, the other in French, the third in German, have signs, tantages, secants, and logarithms of signs and tantages, to every minute and to seven decimals. Also, seven-decimal logarithms from 1 to 10,000, heading for Arigri briggi Tabula Logarithmica; the year 1692.

1885. Oznamin, 'Tables des Sinus,' &c., Paris. This is really Vlaqc in every particular as to the tables, though his name is not mentioned.

1890. Decahal, 'Cursus seu Mundus Mathematicus.' The first volume has seven-decimal tables; logarithms of numbers 0(1)10000; of signs and tantages 0(1)45°, and the signs and tantages also.

1890. Wm. Leybourn, 'Cursus Mathematicus.' This book has internal evidence of having been written before 1680. Seven-decimal logarithms of numbers 0(1)10000; six-figure logarithmic 0(1)16° and 0(1)16°; signs, tantages, and secants, &c., 0(1)45°; the names costes and secant not used.

1890. John Wing (nephew of Vincent), 'A compleat Body of Surveying, formerly published by Vincent Wing,' London. Five-figure logarithms of signs and tantages, 0(1)45°; of numbers, 0(1)10000.

1764. J. H[arries], 'Table of Logarithms, quarto, in Hisston's salo catalogus.' There is a table of logarithms for numbers increasing in their natural order, &c., London. Six-decimal logarithms of numbers 0(1)10000. The logarithmic part has a separate title, 1764, 'A Triangular Canon Logarithmical,' London. Six-decimal logarithms of signs, tantages, and secants 0(1)45°. As far as appears, this table was got up by J. Seiler and C. Price, mathematicians, and it seems to have of signs and tantages a table to sell their own tables of logarithms as well as their own squares.

1710. John Harris, 'Lexicon Technicum,' vol. ii. This volume contains seven-decimal tables of logarithms 0(1)10000, and a complete canon (including versed sines), 0(1)45°, both natural and logarithmic. There is also a table of proportional parts for every integer from 44 to 420. These tables, except the last, seem to have been taken from Sherwin.

1721. In this year was printed at Pekin, by command of the Emperor Kang-Hi, in Chinese type and in three folio volumes, Vlaqc's logarithmic tables of signs, &c., to ten seconds, and of numbers to 100,000. (Brunez, from Vegas, who had seen it at Vienna.)

1741. Deparcieux, 'Nouveau Traité de Trigonométrie Rectiligne et Sphérique,' Paris. Deparcieux is so much better known by mathematicians, and all of his other writings are neglected. The tables are all to seven decimals (though the decimal point is not used). There are logarithms of numbers 0(1)20000; signs, tantages, and secants, &c., 0(1)0° to 0(1)45°, and 0(1)90° to 0(1)135°; and the tantages and secants are in the table we remember to have seen in which the argument of degrees, minutes, and seconds accompanies the logarithms of numbers. The book is also distinguished by its gnomonical tables, and gives rules for finding the tangents and secants of two angles.

* When a person is distinguished by one particular work, his other, and particularly his previous, writings, even on the same subject, go out of notice. Naturally, this does not apply to the author of this note (from the Memoirs of the Academy) a small work on the elliptic motion and on the figure of the planets, in 1747 (?). See (Lamote, Bibl. Astron. ann. 1842.) And how many biographical accounts of Laplace mention it?

1742. J. F. Gleditsch, 'Des vollständigen Mathematische Lexiz sweyter Theil,' Leipzig. Here we have squares and right-angled triangles, numbers of signs and tantages 0(1)45°; logarithms of numbers 0(1)20000; signs, tantages, and secants 0(1)45° to seven decimals; factors of odd numbers not ending with 5, to 10,000.

1743. Rivard, 'Tables des Sinus, &c.,' Paris, with the official approbation of Clairaut. Seven-decimal logarithms of signs, tantages, and secants 0(1)45°; signs and tantages 0(1)10000, without characteristics. Only decimals of numbers 0(1)20000: all with characteristics and no decimal points.

1770. J. H. Lambert, 'Zusammt zu den Logarithmischem Tafellen,' Berlin. This is a miscellaneous collection of tables and formulæ, containing—Primes, and least divisors of all odd numbers which do not divide by 3 or 5, up to 102,000; first ten multiples of all prime numbers up to 213; primes alone up to 102,000; powers of 2 as far as the 76th, and of 3 as far as the 50th; hyperbolic logarithms, seven decimals, 0(1)1000, and 0(1)010; numbers which divide by 2, 3, 5, or only (except those which divide by 2 or 3 only), up to 10,000; 27-decimal arcs 0(1)1000(20)°20°30°(20)°30°, and for minutes and seconds; five-decimal signs and nine multiples 0(1)39°; seven-decimal signs, tantages, and secants, and logarithms of signs and tantages 0(1)36°; tables for hyperbolic logarithmic and cubical logarithmic logarithms; trigonometric, the only table of the kind we have met with; squares and cubes 0(1)1000; figurate numbers to the 12th order, 30°. To 0(1)1000, 8th decimal power of 5 up to the 11th power; seven-decimal square roots 0(1)100.

There is another edition of this useful miscellany, Liezen, 1798.

1785. Douwe 'Tafellen behelzende de Sinussen ... als mede de Logarithmen,' &c., Amsterdam. A complete minute-can to seven decimal places; followed by logarithms to seven places; versus signs and logarithms on the same scale to 90 degrees; logarithms of numbers from 1 to 102,000; and traverse tables.

1778. J. C. Schütze, 'Neue und erweiterte Sammlung logarithmischer ... Tafeln,' Berlin. Also Ricell's de tables logarithmiques. This title and the preliminary explanations are both in French and German. This is a valuable and original collection. It contains the usual seven-figure tables 0(1)10100: a page of multiples of 434 ... and its reciprocals to 48 places, and powers of 2 ... to 25 places. Wolfram's hyperbolic logarithms of all numbers from one to 2200, and from there to 10000 for all numbers divisible by any single digit, all to forty-eight decimal places; common logarithmic logarithms 0(1)11° and 0(1)11°; signs, tantages, and secants, &c., 0(1)45°; the names costes and secant not used.

1788. J. H. Lambert, 'Zusammt zu den Logarithmischem Tafellen,' Berlin. This is a very accurate work, and we have never met with it. (Octavo.)

1883. Callet, 'Tables Portatives de Logarithmes, publiées à Londres par Gardiner,' &c., Paris. This first edition of Callet, as the compiler of the work which we have just cited, was almost entirely that of Gardiner, who was actually and formally so absurd.

* This table was the work of Lint, Wolfram, of the Dutch artillery, and took two years to be published. It is one of the best collections of tables for the fundamenta of the subject which has been made in modern times. Delambre on theotros, Dutt, and Sandbach, &c., in a number of works, all express envy at the manner in which Wolfram so skilfully, and so many pages elapse before the reader can find out what is wanted. The table has also been used by most probably by most of our contemporaries, but this is Delambre's way, and is often liable to confuse a person who is looking on the surface of things, and not knowing in which place the thing is found from which he is drawing incorrect conclusions, I suppose never mentions it in the third or his remarks, or perhaps casually in the middle, though until such mention is made, it is sure to be very liable to be misunderstood.
mentes et perfectiones dans leur disposition par M. Callet. Callet added as much of each kind of table as would leave no white in his last page, and, from Mouton, completed the single-second table of sines and tangents up to 2°. Here are the tables of Vigne, Fr. Math. Tables, 1807, giving the basic sines and tangents to 10°. Here are those of the University of Göttingen, containing sines to every second, to how many places he does not say; shortly afterwards he sent the tangents. Lalanne gives a hint that the approaching publication of Taylor's logarithms prevented any steps being taken to print those. He also states that there was in the library of the Academy of Sciences a manuscript volume containing sines and tangents of 0° to 11° 59' to 12 figures; we suppose he means to 11 places of decimals. M. Robert's manuscript came into Delambre's possession, and was bought at the sale of his books by Mr. Babbage, in whose possession it now is. It is in two large folio volumes, the figures (to seven decimals) being given in fraction columns. Some corrections of Callet, discovered by means of this manuscript, were printed in one of the Nautical Almanacs.

1784. J. G. Vega, Thesaurus Logarithmorum canonum completus, Leipzig, 1794, folio 3°, and the explanations are both in German and Latin. This is, no doubt, up to this time, the table of logarithms; the one of all others which ultimate reference should be made in questions of accuracy. Its contents are, — a ten-normal table of common logarithms 1 (1) 10000, distributed in the common manner, a decade in each line, with the differences arranged in the same way, and tables of proportional parts for the first three places of decimals. In these, the sines and tangents to 10 decimals, 0 (10) 2° (10) 45°. Sines 0 (10) 12° to 10 decimals. Lengths of arcs to 11 decimals. Wolfram's hyperbolic logarithms above described, reprinted from Schulze.

1808. J. P. Gergonne, Traité d'arithmétique et de l'art de négocier kaufmannischer Rechnungen, Commercial logarithms. The plan is to have logarithmic tables for integers and different sorts of fractions, among which eights, tenths, sixteenths, and sixtieths are conspicuous. But it will not do. Mohammed must go to the mountain. When coinage, weights, and measures, are decimalized, the use of logarithms will follow as a matter of course. It is useless trying to bring logarithms to ordinary fractions.

1799. J. P. Robert and L. Ideler, Nouvelles Tables Trigonométriques calculées pour la Division cyclique du Quart de Cercle, Berlin. Delambre speaks of this table; but wrong, in saying it subdivides the quadrant but minutely as those himself and Borda published. Meaning by 1' the hundredth of the right angle, and 1' being 0°00'00", and so on, he divides the quadrant into 0 (10) 3° (10) 50'; but Delambre and Borda's, which is not given correctly in our last article, is 0 (10) 5° (10) 5° (10) 50' (10) 50'. The Berlin table gives sines and tangents and their logarithms, through the quadrant; the Paris table gives logarithms only. The former has no logarithms of numbers except 0 (1) 1000 and 999980 (1) 1000001, all to 36 decimals.

1823. J. B. Teschemacher, Tables calculated for the Arbitration of Exchanges, both Single and Compound, London. This is a book of commercial logarithms, though the author wisely avoided frightening the merchant by mentioning the word in any part of his book, the one book of logarithms for the exchange between London and each other place: the tables average about a page each. With this limited range, the logarithms are really effectively applied. The sines and tangents are very much simplified. We are fully of opinion that such a work might be very useful.

1806. Thomas Whiting, Portable Mathematical Tables, London. The sine figures logarithms. This book is a striking proof that in the old figure, the reduction of the thickness of the type very much increases the legibility. This is a very easy book to read, and would exactly suit those who want a large print. Attempt at small type.

1809. Ebert, Adrion Vlaq Tabulœ Sinuum, &c. Leipzig. The contents are as before described. This is a new (and apparently the last) edition of Ebert's, whose preface is dated 1790. Besides the contents above described there are squares and cubes of all integers up to 1000.

1809. George Douglas, Mathematical Tables, Edinburgh. A long preface; followed by seven-decimal logarithms arranged in lists from 1 to 10,000, the first 900 pages are the sines and tangents. Two supplemental tables, with the same from 10,000 to 11,000, and from 100,000 to 101,000. A complete logarithmic canon for minutes, to seven decimals. A corresponding canon giving the logarithmic cotangents, sine-compressed sines, the latter continued to 180°. A table to convert sexagesimal into decimals; and logarithms from 1 to 180, to 16 decimals. A different arrangement from the usual one in several respects.

1812. In Zach's Monathliche Correspondence, vol. xxxvi, page 498, Gauss proposed his logarithms for the finding of log (a ± b) from log a and log b [Logarithmica, Gauß's, P. C. S.], with a specimen. He stated that he has got into the habit of using five-figure tables of his own construction. Gauss has given a short review of Pasquich's tables (next mentioned) in the 'Göttinger gelehrte Anzeigen,' 1817, No. 158.

1817. J. Pasquich, Tabula Logarithmico-Trigonometric contracte, Leipzig. Title and explanations in both Latin and German. Five-decimal logarithms of numbers 0 (1) 10,000; sines and tangents 0 (10) 5° 2' (10) 50'; five-decimal logarithms of sines and tangents, with a table of the squares of sines and tangents 0 (10) 45'; Gauss's logarithms [Logarithmica, Gauß's, P. C. S.] ranging as follows: log 0 (0) 1, log 1 (0) 2, ... log 9 (0) 9, and a trigonometrical canon of squares is, we suppose, almost unique.

1817. E. A. Matthesius, Tabula ad expeditorem Calculum Logarithmorum Summam vel Differentiam duarum Quantitatum, Altona. This is perhaps the most extensive set of tables of Gauss's logarithms in existence. It is to seven decimals, and A proceeds as follows: 0 (0001) 2 (0001) 3 (001) 4 (01) 5 (1) 17. 1821. Nordmann, 'Adrieni Vlaq Tabulæ,' &c. The explanations are given in Latin and German. To the contents of Ebert's edition are added square and cube roots to seven decimals for all integers up to 1000. This is called the twentieth edition, which very likely it is; but it was the editor's duty to have stated what the other nineteen editions were.

1821. Westphal's tables, Leipzig, contain Gauss's tables, to five decimals, with proportional parts.

1822. Matthisius, 'Gemeine Logarithmen,' &c., Altona. Stereoptyped. This table has figure logarithms from 0 to 10,000, with a supplemental table of proportional parts, arranged on the two sides of a folding sheet, on canvas.


1823. J. P. Grusso, De queues Logarithmische, &c., Tabulen, Berlin. A school-book. Seven-decimal logarithms 0 (1) 10,000; squares and cubes, square and cube roots 0 (1) 1000; arcs of the circle; logarithmic sines and tangents 0 (10) 5° 4° (10) 50'.


No date, 'stereoptyped,' Moritz von Prasse, 'Logarithmische Tafeln,' edited by Mollweide, and then by Juhn, Leipzig. Five-decimal logarithms of numbers 0 (1) 10,000; of sines and tangents 0 (10) 45° put together in a new way, so as to separate the common figures, as in the logarithms of numbers, and to get five degrees into a double page, sacrificing the differences; Gauss's tables, A having 0 (001) 2 (01) 3 (01) 5 (1) 5; and a modification of Gauss's table, in which log z is the argument, and log (z+1) the tabular result, x going through (002) 2 (01) 3 (01) 5 (1) 5. An edition of Von Prasse was published by Hulsta, at Paris, in 1814; and the last-mentioned table was published separately by Weidenbach, Copenhagen, 1829.

1838. G. B. Airy, 'Appendix to the Greenwich Observations,' London. A table of sines and cosines, with the differences given in, 0, 0, 0, and 0, 0, 0. There is a separate table both of sines and of cosines, each of which is therefore a transformation of the other. And each again is the table from 0 to 0 repeated, with transformation, four times; so the complete set of tables is a transformation of one table. It is to five decimals, without differences.

1838. Anonymous (Useful Knowledge Society). After the first sircle, the following addition was made: — One page,
for example, begins and ends with the numbers 5290 and 5310, and with the logarithms 71767 and 75259. According, at the corner of the page, so as to catch the eye on opening the book, is

| 5290 | 71767 |
| 5310 | 75259 |

in full. This plan ought to be adopted in all tables, instead of the abbreviations which are frequently employed as headings.

1840. (Second edition.) Moritz Büblmann, Logarithische, Trigonometrische . . . . Tafeln, Dresden and Leipzig. Six-decimal logarithms of numbers 0 (1) 10080; logarithmic sines and tangents 0 (1) 45°; sines and tangents 0 (10) 45°; arcs of circles.

1840. Hülse's edition of Vega, Leipzig, stereotyped. This contains Gauss's tables to five decimals with proportional parts, in six columns, the additional three (which contains a peculiar mode of treating the proportional parts) having been also suggested by Gauss. The most recent tirade of this excellent work (1846) contains seven-decimal logarithms of numbers 0 (1) 10080; logarithmic sines and tangents 0 (1) 45°; sines and tangents 0 (10) 45°; angles of decimals; five-decimal Gauss's tables A being 0 (001) 2 0 (11) 8 4 (5) 5, with the proportional parts above alluded to.

1845. Fifth edition of Stieltjes' 'Sammlung von Hülstafeln' (first published in 1822), Altona. This is a well-known and valuable astronomical collection. What we have here to do with is the republication of Encke's four-figure logarithms, 0 (10) 5000; and 0 (4) 10 (10) 45°, and Gauss's logarithms 0 (001) 1-80 (1) 4.

1846. R. Sheepehanks, Tables for facilitating Astronomical Reductions, London (also issued two years before, without title-page and author's name). The most complete of the four-figure tables we know of, and will do for the purpose oftener than our orthodox septenaries are aware of. Logarithms 0 (1) 1000, with proportional parts, in decimals, logarithmic sines and tangents, in decimals, 0 (1) 24°, with proportional parts for 10°, and 0 (1) 1°; table for converting sidereal into mean solar time; logarithmic sines, tangents, and secants 0 (1) 6° (10) 45°; constants for precession; tangents and secants 0 (10) 80° (10) 80°, with a rule for the rest; Bessel's refractions; Gauss's tables, thus arranged, log z as an argument gives

\[
\log \left(1 + \frac{z}{1 - z}\right)
\]

a tabular result, and log \(\frac{1 - \frac{z}{1 - z}}{1 + \frac{z}{1 - z}}\) as another, log z being 0 (001) 900 (001) 2 (1) 4 in the first table, and 0 (001) 1 (001) 3 (1) 4 in the second; log. sin \(\frac{1}{2}\) hour angle, in time 1° (1) 30°; numbers to logarithms 0 (001) 1.

1847. J. C. A. Stöhr, Elemente der Logarithmischen Tafeln zu sieben placent of decimals, containing logarithms of numbers from 1 to 120,000, numbers to logarithms of 0 to 1, logarithmic sines and tangents to every second of the circle, with arguments in space and time, and new astronomical and geodesical tables; Edinburgh, stereotyped. We do not yet know enough of this table to form an opinion. It is printed at the whole expense of the framers, an enterprising officer attached to the Indian survey. The types were cast for the work, and being of the old figure, we wish of course that they had not been so; but we must say that they look better than any existing figure of the old form could have done in so heavy a page, and that also the unity of the type used in logarithms of numbers with that of the trigonometrical ones is a great advantage. It is a most public-spirited undertaking.

Among the titles of tables which we might have said something on if we had seen them, collected from different sources, are those of—John Lauber ete., Leyden, 1828, 8vo.; Loubert Middendorff, Cologne, 1648, 12mo.; Henry Phillips, London, 1667, 8vo.; Instituti Mathematica, London, 1667, 12mo.; Strachan, Witteberg, 1665, 12mo., and Amsterdam, 1700, 8vo.; D. R. Van Meerop, Harlingen, 1671, Chr. Grünberg, Tabellen Mathem., Berlin and Frankfurt, 1690 (oblong form); Chr. Grünberg, Pisanische Mathem., Berlin and Frankfurt, 1700, 8vo.; Chr. Wolff, Magdeburg, 1711, 8vo.; J. G. Leibnitz, Giessen, 1726, 8vo.; Raph. Leibnitz, Harlingen, 1726, 8vo., and supplement in 1748; J. C. Neukommers, Leipzig, 1759, 4to; J. Meinhold Da Mau, Lisbon, 1790, 8vo.

To our old tables of interest we have to add the following. Stevinus, in the 'Practique d'Arithmetique,' appended to his Arithmetic, Leyden, 1634, reprinted by Albert Girard in Stevinus's collected works, 1625, gave the first tables of compound interest and annuities. They precedence the famous tract 'La Disme,' in which decimal fractions were first proposed. And as this Practice being rather have been conceived the name of the Dismes at the end. If rational arrangement had been studied; and the Disme again should have preceded it, on the same supposition; we must infer it to be most likely that the tracts were placed in the order in which they were written. If this be the case, then it is pretty certain that these tables of compound interest suggested decimal fractions, the account of which speedily follows them. They are constructed as follows:

Ten million fractions, as taken as the basic, is what is called it, and a rate, say five per cent, being chosen, the present value of ten millions due at the end of 1, 2, &c., up to 30 years, are put in a column, to the nearest integer. By their sides are the sums of their values, which give the present values of the several annuities of ten million, as follows:

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The rates are from 1 to 16 per cent, and also for 1 in 15, 16, &c., to 1 in 22; or, as the French say, dener quizoiz, dener seize, &c. At the end is a direction to dispense, when convenient, with some of the last figures.

There is thus a virtual use of decimal fractions preceding the formal one. The same thing happens in the tables of Richard Witt, mentioned in our former article, which we believe to be the first English tables of compound interest, and the first English work (except a translation of the 'Disme' of Stevinus) in which decimals were used; the use of them being something more than the virtual use by Stevinus in the Practique. The next English writer who gave tables of compound interest, Robert Butler, in his 'Manual of Interest,' London, 1633, makes a rather more decided use of these fractions than Witt, and uses the phrase decimal fractions, which had then hardly found its way into books. It should be noted that both Witt and Butler give real half-yearly and quarterly tables, as well as yearly ones.

Mr. Pookor, in his Bibliography of Annuities, &c. (Family Explanation . . . of Assurance upon Lives, London, 1842), gives the following works, which we do not remember to have seen:


In Newton's 'Scale of Interest,' mentioned in the list of logarithms, is a set of tables for six per cent, then the maximum legal rate in London, there is here what is elsewhere—a common almanac, with months, dominical letters, and fixed saints' days; having, in lieu of astronomical information, simple and compound interest and discount tables, telling for each day the amount of one pound from the beginning of the year, or the present value for the end.

The first edition of Smart's tables, the original of all our large tables of compound interest, is 'Tables of Simple Interest and Discount,' at 3, 4, 5, 6, 7, 8, 9, and 10 per cent. per Ann.; also tables of compound interest at the same rates, whereby, &c. By John Smart, at the Town Clerk's Office, London: London, 1707, 4to. (duodecimo size). This second edition, of 1726, is as large, compared with the first, as it is possible its author 'John Smart of Guildhall, Gent.' may have become, compared with the subordination at the town clerk's office. The first edition (which we did not know of when we wrote our last article) we find all modern writers knew as little), besides a smaller range of rates, has not the half-years, and has only six decimal places.

The tables of simple interest are also of very little extent. This set of tables was incorporated (probably by printing) in the article Interest in the second volume of Harris's 'Lexicon Technicum,' London, 1710. There was an abridged edition, with some of the rates and of the half-years left out, in November, the table of compound interest for one half-year, &c.
but still to eight figures, 'Tables of Interest, &c., abridged for the use of Schools, in order to instruct young gentlemen in the use of Decimal Fractions,' by John Smith, &c., London, 1750, quarto (octavo size).

Commercial tables of any real power are rendered impossible in practice by the use of shillings, pence, and farthings, except by the extensive use of them very sparingly. If, for instance, the rule for decimating the parts of a pound [Computation, P. C. S.] were well learned and properly used, some of the older tables, which have fallen into disuse, might be revived with effect. Two of the mentioned in our former article will certainly be reprinted when the time comes; Brown's 'Arithmetica Infinita,' and Webb's 'Tables for buying and selling Stock;' the main portion of the former is the first nine multiples of the decimal, which expresses any number of farthings in a pound. Thus, under 7s. 6d. are -3854166... and its multiples up to nine times. The latter has the multiples necessary to find the quantity of stock which answers to any sum of money, and vice versa, at different prices. These are both pocket tables, and their places are supplied at present by works of much greater bulk and less extensive use.

We go a little out of our way to mention Mr. Edward Sang's 'Assurance and Annuity Tables,' Edinburgh, 1841, folio, a most extraordinary work. The author learnt to print that he might set it up with his own hands, and caused the distribution of the sheets extensively, with the free care used in composition. It contains for a single life, and for the Carlisle tables at 3 per cent., every thing. All annuities and assurances, temporary or deferred, or for the whole life, allowance being made for the sub-sequent period; all the yearly risks of such policies; assurances at increasing or decreasing premiums; five-figure logarithms and antilogarithms, &c., &c., &c. And every result has its logarithmic scale worked by its side result for reference. What is so coldly looked at by the assurance offices, those who study the human mind will be at no loss to decide. The typography is so beautiful, the paper and type so luxuriant, that a century hence a copy will have the same beauty of its own life. Persons having the absolute administration of property, as trustees, corporations, &c., are entitled and bound to grant leases for such a period as is deemed necessary to good husbandry; and this period has, by usage, in the ordinary case, been fixed at nineteen years. There have been many questions as to the extent to which persons holding under entail may grant leases, because in many instances attempts have been made in this form to alienate a considerable estate in the property, which have been strenuously resisted by the successors. In the celebrated Queenberry case, leases granted for ninety-seven years, on a grasmun (that is, a sum of money paid by the tenant on entering, like a fine in England), were struck at by the court of chancery, in order to alienate part of the property (2 Dow, 90). In later cases, leases of forty and thirty-one years have been found ineffectual. A lease of twenty-one years is the longest that has been sanctioned in the court of chancery, but even this case has shown that he has an interest in impugning the contract.

Writing is necessary to constitute a lease, although possession during the part that may remain over of a year begun, may be held as a right from suffrance and acquiescence in its commencement. The proper form of the written agricultural lease has been an object of much attention by conveyancers, and there is a considerable degree of uniformity in the practice throughout the country. There are usually nineteen clauses, as follow:—1. The Description of Parties. 2. The Destination, in which the extent to which assigning or sub-letting is permitted or prohibited is set forth, and provision is made for the arrangements in case of the assignee's default. 3. Clause of Possession, describing the subject let. 4. Duration. 5. Reservation, if there be any rights such as that the tenant may sub-let his land. 6. Landlord's Meliorations, containing such obligations to improve the subject as the landlord undertakes. 7. Warrandice, or guarantee of the title given to the tenant. 8. Rent clause. 9. Tenant's Meliorations, setting forth such improvements as the tenant undertakes. 10. Preservation, containing the tenant's obligations to keep the building, fences, &c. in repair. 11. Insurance, in which the tenant becomes bound to insure the building, crops, &c. against the fire. 12. The tenant's right to the reversion is to be a remnant of feudal usages, is now comparatively rare—it binds the tenant to grind his corn at the mill of the over-lord. 13. Management. 14. Bankruptcy, providing in general for the landlord's rights in case the tenant should cause himself to be declared bankrupt. 15. Removal, by which the tenant engages to
erect the premises at the prescribed term. 16. Reference, providing for arbitration of disputes. 17. Mutual Performance, indicating penalties to be paid by the party failing. 18. Rescission of contract. (Ramsden, P. C. S.) 19. Testing clause, containing the formalities of the execution of the contract. Of these, the clause of management is the most important. It is now much doubted how far it is good policy to bind the tenant to the observance of any farming conditions, control of agriculture. In the highly improved districts, where very scientific farming is expected, the tenant is generally more capable than the landlord of estimating the value of improved agricultural methods. Generally means of increasing the produce of the soil, are at present the object of much attention among farmers, and where tenants cannot alter a fixed routine without the risk of a law-suit, an agreement is laid on the practical application of improvements. The landlord's chief interest in any routine being followed, is simply the preservation of the land from deterioration towards the conclusion of the lease. On the subject of the usual provisions, for management, Mr. Hunter says: 'In those districts where agriculture is best understood, the following are the ordinary rules of management during the currency of the lease:—1. White corn crops ripening their seeds shall never be taken from the same land in immediate succession. 2. A certain proportion shall be under turnips or plain fallow every year, and be sown to grass with the first corn crop after turnips or rape. 3. Grass on the chief part of the land shall be removed from the produce of the farm, nor straw nor hay made from the natural herbage, shall ever be carried off the farm. It is sometimes added, that no turnips or rape or hay of any kind shall be made on the poorest or weakest soils. And sometimes required that no less than half of the turnips shall be eaten by sheep on the ground where they grow. 4. If the soil is not such as to admit of being ploughed and cropped every year, it is stipulated that a certain part or proportion shall be always in grass, and that land laid down to grass shall be, before being broken up again, two or more years in pasture. 5. During the first five or six years of a lease, the conditions are sometimes more specializing the tenant to have so much more in fallow or turnips every year, and so much more in grass, and also to leave the farm in a particular shape, so as to admit of the incoming tenant pursuing a correct rotation of cropping from his very entry. Or, 6. What is approved of by some agriculturists, it may be agreed that the lessee shall cultivate the lands according to the rules of husbandry, but with the addition of specific regulations applicable to the four or five last years of the lease. 7. Adherence to the course prescribed may be enforced by conditioning for payment of additional rent in the event of contravention, besides damages, and with a power to prevent further contravention by which purpose reason to power to make a summary judicial application is occasionally taken. Or, 8. Liberty may be given to the lessee to devise from the prescribed course upon payment of an additional rent specified, which may be found to be sufficient to counteract the pecuniary and personal interest, and not liable to judicial modification. 9. In some districts, though seldom in the most improved, there is occasionally a stipulation that the tenant himself reside upon and manage the farm. (1. 363-370.)

(AR. TREATISE ON THE LAW OF LANDLORD AND TENANT, WITH AN APPENDIX CONTAINING FORMS OF LEASES, BY ROBERT HUNTER, ESQ., ADVOCATE, VOL. 8, 1845.)

TENIODES, a family of Acanthopterygious fishes nearly allied to the Mackeralis. The species comprising it are all long flattened fishes, with very small scales. The following are among the principal genera: Lepidotes, tenioid fishes with elongated mottons, a wide gape, projecting under jaw, and strong sharp cutting teeth. The ventral fins are reduced to small scaly plates. The tail is well formed. The Lepidotes argyrotus of the sea and benthic fishing is an example. It is of a bright silver colour, and attains a length of six feet. It is one of the rarest of British fishes.

Trichirrus resembles the last genus in the character of the head, but has neither ventral nor caudal fins, the tail being represented by a long slender compressed filament. The Trichirrus lipsusus of Linnæus, an inhabitant of the Atlantic Ocean, attains a length of more than 12 feet and resembles a beautiful silver riband.

Gymnotus, the Deal fish, has a very small protractile mouth with small teeth. It has no anal fin, and the caudal is considerably depressed. The Gymnotus is not more than four and six feet in length, but does not exceed a table-knife in thickness. An original description of it may be found in Dr. Fleming's 'British Animals'.

Crepala, the Ribbon or Band-fish, is a well known Mediterranean genus. Crepala is short, the gape oblique, and the teeth well developed. The dorsal and anal fins are both long, and reach to the base of the caudal. The ventrals are serpentine developed. The Crepala rubens, a beautiful little fish about a foot long, and of silvery blue tinge, is occasionally found on the southern coasts of Britain.

The genus Lepidotes of Giorni has a short head with a single row of teeth, and a long caudal fin. The caudal fin is distinct, but not prolonged. The Lepidotes alpinus is allied to Gymnura, but has the tail prolonged into a slender filament, exceeding the length of the body.

TEN: TERRIS, a genus of fossil ferns with broad ribbon-like leaves. In the Cotilide series of Yorkshire and Lancashire. (Brongniart.)

TAGORE, DWARAKANKH. [RAMBOURNE ROT, P.C.S.]

TAILZIE, in the law of Scotland, is the technical term corresponding with the English word Entail, which now generally supersedes it in colloquial use, even in Scotland. The early history of Entail law in Scotland in some respects resembles that of England, but in later times they diverged from each other. In Scotland there was no early effort, such as the statute of Westminster the Second (13 Edw. 1.) which was a favourite provision of English lawyers, and which, if there appear to have been on the part of the judges that inclination to permit perpetuities to be defeated by fictions which was shown in England. Devices however of a very similar nature were adopted in Scotland, in order to defeat attempts by holders under entail to use their lands as if they were absolute proprietors. The first and simplest restriction laid on the destined heirs of an entail was in the form of a mere prohibition, against contracting debts which might occasion the attachment of the estate by creditors, selling the property, altering the order of succession, and the like. A provision of this character, called the 'Prohibitive clause,' was however by the entail accomplishing the end; because if a creditor had really attached the estate for debt, or a person had bona fide purchased it, he was in good faith for wresting the title out of his hands, that the proprietor was under a prohibition against permitting such occurrences. A second provision was added, called an Irritant clause, by which any right acquired contrary to the provisions of the entail was declared to be null. Still this did not effectually intimidate the holder under the entail from making efforts to break it, and did not give the next in succession a sufficient title to interfere. A third provision was added called the 'Resolutive clause,' by which the right of the person who contravened the entail to recover his estate was limited to the amount of the suit. It was provided by statute (1685, c. 22) that all entails should be effective which contain Irritant and Resolutive clauses, and recorded by warrant of the court of session in the Registers of Entails, a rule which is not in force in the present day. The law consists of two main clauses containing the Prohibitory, Irritant, and Resolutive clauses. No attempts were made to counteract the Entail system by provisions of a more radical nature. They are not in direct compliance with the genius of the law of Scotland, and it became a permanent feature in the institutions of the country. A sort of judicial war has however been carried on against Entails individually, which has been productive of a vast amount of litigation and strife, has occupied much judicial time, and has tended to place the titles of property in a precarious and doubtful position. An Entail is excluded from the favourable interpretation of the law. The interpretation of its clauses is to be what is termed strictissimus juris. The intention of the frame is never to be contemplated: every blunder is to be given effect to, and nothing is to be explained by reference to the context, if its own meaning as a sentence is doubtful. Thus, in a late case, those who held under an Entail were prohibited among other things from contracting debt to the effect of the estate being attached. The Irritant clause contained the words, 'If the holder shall not perform the premises, by breaking the Tallizie, contracting of debts,' &c. (enumerating other contraventions), it was provided that 'then and in any of these cases, the said venditures, alienations, dispositions, and other attachments, as well as the arrears, debts, obligations, made to the contrar' should be null. It was found that proceedings by creditors to attach the estate for debt were good, because they were not by name enumerated as contraventions, and this that should be null, though they were prohibited, and mentioned among the things which, if
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coming to pass, should cause a cumulus. (Dufief's Tractatus v.
Dunkhar, 28th January, 1842, 4 D. B. M. 923.) Some
statutory enlargements have been made on the powers of people
living in the vicinity of the town, and of the younger children: but the system is still productive of great
domestic inequality, and it is to be hoped that in no long
time it will be swept away as an impediment to the improve-
ment of the country and an injustice to the mercantile
classes.

TAJURRAH is a sea-port in Africa, situated at the most
western corner of the Gulf of Aden, in 11° 47' N. lat. and
45° 44' E. long., and is a large town which extends several miles farther west, and is called the
Bay of Tajurrah. The anchorage is of moderate extent, and
large vessels must remain at some distance from the shore.
It certainly, except during the severe monsoon season.
The town lies at the base of a group of hills of moderate elevation,
which run north and south, and are furrowed by narrow glens,
which during the rainy season bring down a great volume of water.
It contains about 500 houses and a population of 1,200
or 1,500 inhabitants. The houses are built of wooden frame-
work, covered with matting. There are only a few stone
houses in the town, and two mosques. As no cultivation is
conducted on the outskirts of the town, the inhabitants are
all principally engaged in the trade in slaves and salt. The
salt is obtained from the lake of Assal (Adol, P. C. S., v. 1 p.
94), and the slaves are brought to the place by the Dallalko,
or robbers of the coast, in large canoes of the type of a canoe
and Shoa. (Aynwimia, P. C. S., p. 20.) These articles go
chiefly to Mocha and Hodeida; to Aden, wool, sheep, goats,
and butter are sent. There is no bazaar in Tajurrah, but the
commerce of the town, which is conducted by the slave and
bead-bearers, is considerable. The local trade consists of
beads, buttons, fish-hooks, and tobacco. Water is plentiful,
but grass is scarce, and fodder for horses is obtained with
difficulty. The climate is very hot; during the last days of
May the thermometer at noon ranges between 80° and 82°,
but the heat is rendered less oppressive by the sea-breeze,
which generally sets in about eleven o'clock of the morning.
Almost all the inhabitants belong to the Dallalko, and are
ruled by a local chief, who is styled Sultan, and is considered
the chief of the whole nation. None of the Danakil tribes pay
obedience to his orders, but they send him annually a present
of two hundred head of cattle and camels. As this town is the
nearest port to Shoa, and the British have entered into a
closer connexion with the sovereign of that country since
their occupation of Aden, it is hoped that Tajurrah will soon
rise to greater importance. The British have also made a
 treaty with the Dallalko and Somalil, and have acquired two
larger islands, situated near the entrance of the Bay of Ta-
jurrah, and a smaller one which lies farther within the bay;
but it is not known if they are actually taken possession of
and settled.

(Isemberg and Kraft's Journals, detailing their proceedings
in the Kingdom of Shoa, &c.; Kirk's Report on the Route
from Addis Ababa to the Red Sea, London, 1841.)

TALBOTYPE. [Photopf Hat, P. C. S.]

TALLOW (French, suif; German, talg; Italian, secco,
sego; Russian, sovo, taponos; Spanish, sebo) is animal fat
[FAT, P. C. S., p. 204] melted and separated from the fibrous
or membranous matter which is naturally mixed with it.
When pure, tallow is white, and nearly tasteless; but the
tallow of commerce usually has a yellow tinge. It is di-
vided, according to its qualities, into various kinds, of which
the best are used for the manufacture of candles, and the
inferior for making soap, greasing machinery, and some other
purposes. Much tallow is used in the dressing of leather.
This fat is also used in the making of candles in this country is of home production, and, according
to a paper on 'Artificial Light from Solid Substances, and the
Manufacture of Candles,' published by Arthur Aitkin, Esq.,
in the Manchester Quarterly Review, 1840, it is stated that
the manufacture of tallow and tallow. candles (part ii. pp. 123-127), is fitted for use by the renderer,
who chops into pieces the fat and meat received from the
butchers, and boils it in water, by which operation the greater
part of the blood is extracted from the skin, flesh, and
beef, to the top, whence it is removed by skimming. The remaining
fat is subsequently squeezed from the membrane by a powerful
press, leaving the membranous matter in the form of a cake, which is cut into smaller pieces, and dried in the sun,
which, when macerated in warm water, softens and swells, and
becomes a wholesome and palatable article of food for
poultry, dogs, and other domestic animals. It is said to be
extensively used in fattening poultry for the market. Dr.

Ure, in noticing this subject in his 'Dictionary of Arts,' &c.,
adores, describes the tallow as 'the watery matter contained
in every cow, horse, or any other animal, which, when
boiled in water, yields a clear liquid, called tallow. The
caucasian, because the fibrous and fatty matter mixed with it
tend to promote putrefaction: and directs that the liquid
be strained through a sieve into a second copper, and
then treated with earth in a boiling teapot."

Almost all our imported tallow is brought from Russia,
where this article is produced in enormous quantities. Kohl,
in his work on that empire, gives a graphic account of this
great production of the country, and how it is brought by
a network of canals, which is very well adapted to the
translation, published in Chapman and Hall's 'Foreign
Library,' 1842, pp. 501-503), we condense the following par-
iculars. — The exports of St. Petersburg, he states, are
estimated to amount to about 15,000,000 rubles (the ruble
being, according to Mowry, C. P. C., p. 325, worth 3s. 1d.)
annually, of which one-third consists of tallow; while the value
of the exports of this article from other Russian ports is prob-
ably about 30,000,000 more. For these 70,000,000,000 of rubles
about 25,000,000,000 of lbra. of tallow is furnished to the rest
of the world, providing the chief supply of soap and candles to
England, France, Germany, Scandinavia, Italy, and the other
countries of Europe; as well as to Spain, where they are
used as a local currency. The tallow so produced is called
Salgans, as they are called, are exclusively in the hands of
the natives of Great Russia, who have their establishments in all
parts of the steppe. They buy the cattle by hundreds and thousands, and all the further supply for
the tallow trade is brought by them to the salgans to be slaughtered; and Kohl states, that if the
season proves tolerably moist, so that the cattle may fatten
well, the speculation is productive, but that a long-continued
drought is ruinous in its consequences, the tallow-bottlers
remaining empty, and the mesre oxen having nothing but their
skins wherewith to remunerate the speculators. After such
a season, he adds, the provender of the salgans usually close
their books, and declare themselves insolvent, having so
seldom possessed of much capital, and generally carry on
their operations with the money advanced by the merchants
of the sea-port towns.'

The salgans, to which the tallow-bottlers usually begin to
drive their oxen in small numbers towards the close of summer,
generally consist of a spacious court-yard surrounded by the
buildings necessary for the manufacture, embracing shambles
for slaughtering the oxen, houses containing enormous boilers
to boil down the flesh, places for salting the hides, and count-
ling-houses and dwellings for the workmen. In the summer of these establishments, even the birds of prey,
which hover about all the year round, attracted by the
nauseous smell, which, however alluring to them, is
described as being infinitely disgusting to a visitor, and evi-
dently distressing to the workmen. The smell is not so
inquieting, as if conscious of their approaching fate, and be-
come so restless as they approach the salgan, that it is often
necessary to drag them to it by main force, notwithstanding
the device of mixing with the herd, as decoys, a few tame
oxen accustomed to the place, and trained to the service.
About a hundred oxen are driven into the court-yard at once,
and of these twenty or thirty are conducted immediately to
the slaughter-houses, where six or eight butchers are kept con-
nstantly at work, in the midst of stench and filth which Kohl
describes as exceeding everything that the mind can imagine.
The business is generally carried on during the rainy season;
and owing to the use of the fat from the edible part of
the whole salgan is soon converted into a swamp of blood
and mud, the smell of which is never removed by the rigours
of the winter or the storms of the spring. It appears also
that the animal skin and hide is considered an artificial manner to occasion much needless suffering to the
beasts.

After the carcasses are skinned, three or four poops of flesh
are cut off from the flank and brisket, for not being fat
meat, there being little fat in those parts of the body; but
owing to the barbarous method of slaughtering, this meat is
so much injured that none but the poor will buy it. The ro-
natured skin, the visceral omentum of the stomach, intestines,
which are given to the pigs (of which a consider-
able number are always kept at the salgan to fatten during the
season), is thrown into the boilers, of which there are from
to six in every salgan, each large enough to contain the
Dash of ten or fifteen ozen. A little water is put into the boiler, to prevent the 'sud' from being too hot, or the feathers, being burned. The fat, as it collects at the top, is skimmed off with large ladles; and before it is quite cold it is poured into the casks in which it is afterwards shipped. The first fat which cools, is the whitest and is a good white, while is quite greasy, which follows has a yellowish tinge. When there are not sufficient casks at hand, the hides of the slaughtered oxen are sewn up, and the tallow is poured into them, 'till, our author observes, the whole assumes this form sometimes like that the animal wore when living. Of those tallow-stuffed oxen, he adds, 'a large number are usually seen standing about the salgans.'

A further degree of fat, but of very inferior quality, is sub-
sequently obtained by subjecting the mass of bones and flesh to fuse to a tough pressed. This tallow, which is rarely exported, is of a dark brown colour, and is used for greasing wheels and for other coarse purposes.

An ox in good condition, it is stated, will yield from seven to eight pounds (350 to 390 lbs.) of tallow, which is generally worth from eleven to fifteen rubles a pound. The fat is always so greatly in demand, that the merchants often pay part of the price for it while the ox are yet grazing on the steppes; and the singular appearance of the salgans is heightened by the number of merchants and their clerks in attendance, for whom the duration of the season, during which the oxen have fattened comes to receive his rent; the workmen for their wages; cattle-dealers to contract for further supplies of oxen, while perhaps some merchant is in a hurry to purchase and advance means, for the oxen to be purchased by them; and 'a colonist comes in to bargain for the fattening of some 200. In the season he receives back walking masses of hog's-tallow, too yellow and coarse for the market, till the grutters have been a little refined by surly good fats. Sometimes a wealthy nobleman, possessing oxen, but no tallow-making establishment of his own, makes his appearance to farm a salgan for a few weeks, which, and the grutters visit the place to buy the raw-material for feeding pigs on the steppes, or to bar-
gain for the hofas and hides. 'The Turkish captains come eagerly to obtain the tallow in its greatest purity at the fountain-head, for tallow so much esteemed by the gourmands of Constantinople to be idol worshipped in enlightening their darkness; in short, however badly death may be at work, there is, meanwhile, no want either of life or battle in the salgans.'

Notwithstanding the nature of the employment, there is always plenty of hands found to seek engagements in the salgans, the wages being high. The workmen usually earn about 75 or 80 rubles per month during the season, which lasts about twelve or thirteen weeks. In the neighbourhood of Odessa, Koli states, there are seven salgans, in which probably 25,000 oxen are killed every year, besides countless uncounted numbers, which are sent away from Nikolaev, Saratov, Kishinev, and other places; besides, they will be found on an equal large scale.

From details quoted in M'Culloch's Dictionary of Com-
mmonwealth, it appears that the merchants of that city divide the tallow which they receive from the interior into white and yellow candle-tallow, and common and Siberian soap-
tallow; the latter, which is considered the best tallow for soap-making, being brought by several rivers from Siberia to the lake Ladoga, and thence to the Neva by the canal of Schlusselburg. An embargo on the export, is appropriated to the reception of the tallow on its arrival, in which it is se-
lected and sorted (or brisk and) according to quality, after which the casks are marked with the quality, the date of the selection, weight of the contents of the barrel or cask. The white tallow is usually brought in conical casks, 22 feet in diameter at the largest and 14 at the smallest end; but the yellow tallow is commonly in casks of the more usual shape. 'Tallow is said to be a clean, dry, hard, and broken, and of a fine yellow colour throughout. The white tallow, when good, is brittle, hard, dry, and clean. The best white tallow is brought from Wurtemberg. This however is said to be better the more greasy and yellow it is. M'Culloch states that 120 pounds of tallow, gross weight (of which the cask is usually about 10 per cent.), make a Peters-
berg candle.' Soap-tallow is stated. 'Soap-tallow is stated. 'Soap-tallow is stated.'

In his account of the candle-manufacture, referred to at the commencement of this article, Mr. Aikin refers to the practice of mixing different kinds of tallow together according to the mode in which the candle is intended. 'We understand, that the various gradations of bleaching are produced by different proportions of the mixture; but it is stated in the article 'Candle, in the 'Encyclopaedia Britannica,' that one-half of sheep's and one-half of bullock's tallow should be used, and that hog's tallow, though it is inferior, is generally used for candles, gutter, give an offensive smell, and produce a thick black smoke; and Dr. Ure states that 'mutton-suet, with a propor-
tion of ox-tallow, is selected for mould candles, because it gives them gloss and convenience. When weighed in the propor-
tions, and cut up into small pieces that it may melt the more readily, the tallow is, according to Aikin's account, put into a boiler with some water, which tends to prevent its becoming too hot, and melted at a temperature of about 90°. Some water is then sprinkled upon it, which has the effect of causing such droops and impurities as may have escaped the skimmer to sink to the bottom, after which the-
clear tallow is let out by a spout into suitable vessels, and when sufficiently cooled, but while yet retaining its perfect transparent fluidity, it is fit for use. Different kinds of tallow melt and retain their fluidity at very different degrees of tem-
perature; the fat which is deploited about the kidneys being, in all animals, harder than that found in the cells of the ox, and especially than the half-offy fat found in the muscles and other soft parts; while the fat of some animals is harder than that of others; but in the case of the tallow when the fat is melted, it is found, and mixed with the wax, that the former is greatly much sooner than that of the ox or horse. Accordingly therefor to the different kinds of fat which may enter into its composition, tallow will be found to vary considerably in its fusibility: but it is necessary for the tallow to be properly applied, and brought to the correct point, though Aikin states that he had seen a boiler full of tallow perfectly fluid at 72°, and even then not sufficiently cooled to be made into candles; nor was this, he observes, considered remarkable; 'whence we may conclude that the same, when made into candles and exposed to the air, loses much of its fusibility.' The author of the article above referred to in the 'Encyclopaedia Britannica,' observes that no water should be mixed with the tallow, and that the tallow must be allowed to cool for two or three hours, before it is ready to use. The wicks, being quite dry, should be imbed, and thus cause the candles to spatter in burning. He adds that in removing the melted tallow from the boiler to the tub or vessel in which the candles are dipped, it may be passed through a coarse horse-


47. This act reduced the duty on about 750 different articles on which the receipts had amounted to about 270,000L. The general principle of the measure was to reduce the duty on raw materials to about 6 per cent., to limit the highest duty on complete manufactures to 12 per cent., and to cut off the duties on complete manufactures to about 20 per cent. The number of articles in the tariff was now reduced to 818. Foreign horned cattle, sheep, goats, swine, salmon, soles, and other fish, and fresh beef and pork, which had been admitted formerly, were admitted on paying a duty under the tariff of 1842. In 1844 the duty on foreign wool was abolished. In 1845 Sir Robert Peel effected further improvements in the tariff by abolishing duties on tea, coffee, and spirits, and on 430 other articles, on which the duty amounted to 390,000L. By this plan of expenses of warehousing are saved [VALENCIANS SYSTEM, F. C.], and a number of troublesome accounts and impediments to business are got rid of, but for statistical purposes the customs department retains the power of examining articles which do not pay duty. The paramount object of the tariff reform of 1845 was to encourage the abundance and cheapness of raw materials of manufacture. In the same year, by an act (8 Vict. c. 7) to repeal the Duties of Customs due upon the exportation of certain Goods from the United Kingdom, the duties on the exportation of coal, culm, &c. are wholly repealed.

Caps. 84 to 94 of the 8 & 9 Vict. are all acts relating to Customs, Trade, and Navigation, and they all came into operation on the 4th of August, 1845. Cap. 84 is 1 An Act to repeal the several Duties of Customs, &c., relating to the importation of Leather. Cap. 87 is 1 An Act for the Prevention of Smuggling, and specifies the acts which constitute smuggling, and the penalties. Cap. 89 is 1 An Act for the Statutory registration of vessels, &c. Cap. 86 is 1 An Act for the Registration of Vessels, &c. Cap. 91 is 1 An Act for the Regulation of the Trade of British Possessions abroad. Cap. 94 is 1 An Act for the Regulation of the Trade of the Isle of Man.

On the 26th of June, 1846, the royal assent was given to an Act which abolished all the other principles of free trade by a total repeal of several important duties, and by a great reduction of numerous others. It is entitled 1 An Act to alter certain Duties of Customs" (9 & 10 Vict. c. 23).

On the same day (June 26, 1846) the royal assent was given to the act for repealing the duties on the importation of foreign corn. It is entitled 1 An Act to amend the laws relating to the Importation of Corn (9 & 10 Vict. c. 22). By this act certain reduced sliding scale duties are substituted for those of 1842, and they are to continue till Feb. 1, 1848, when all duties on the importation and entry for home consumption of corn, grain, and flour, in the United Kingdom and in the Isle of Man, are repealed, with the exception of 1s. per quarter on all wheat, barley, bear or bigg, oats, rye, peas, and beans, merely for the purpose of registration of the quantities imported. The sliding scale duties are: wheat-meal and flour, barley-meal, oat-meal, rye-meal, and flour, pea-meal, and bean-meal to be 4d. for every hundredweight.

The sliding-scale duties of 1842 (5 & 6 Vict. c. 14) are given under Wheat, F. C., p. 305. The duties of 9 & 10 Vict. c. 22 are as follows:

<table>
<thead>
<tr>
<th>Grain</th>
<th>Per Quarter</th>
<th>Under 48s</th>
<th>48s &amp; Under 50s</th>
<th>50s &amp; Under 51s</th>
<th>51s &amp; Under 52s</th>
<th>52s &amp; Under 53s</th>
<th>53s &amp; Upwards</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wheat</td>
<td>5s</td>
<td>9</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Oats</td>
<td>48s</td>
<td>9</td>
<td>7</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Barley, bear</td>
<td>4d</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

In 1840 Mr. Porter, of the Board of Trade, in his evidence before the Parliamentary committee on import duties, showed that out of a total amount of 29,962,610L. of Customs duties received in 1838, 17 articles produced 52 per cent. or £21,700,630, and 29 articles produced 26½ per cent. or 898,661.

In 1842 Sir Robert Peel effected some improvements in this system, which were carried into effect by 5 & 6 Vict. c. 14, No. 182.
British possession in America, or of any British possession within the limits of the East India Company’s Charter, into which the transportation of foreign sugar is prohibited, and imported from thence, the duties following:

**C. s. d.**

<table>
<thead>
<tr>
<th>Sugar Type</th>
<th>Duty Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candy, brown or white, double refined sugar, or sugar equal in quality to double refined, per cwt.</td>
<td>5 0 0</td>
</tr>
<tr>
<td>Other refined sugar, or sugar rendered by any process equal in quality thereto, per cwt.</td>
<td>1 1 0</td>
</tr>
<tr>
<td>White refined sugar, or sugar rendered by any process equal in quality to white clayed, not being refined, per cwt.</td>
<td>1 6 4</td>
</tr>
<tr>
<td>Brown sugar, being Muscovado or clayed, or any other sugar, not being equal in quality to white clayed, per cwt.</td>
<td>0 1 4 0</td>
</tr>
<tr>
<td>Molasses, per cwt.</td>
<td>0 5 3</td>
</tr>
</tbody>
</table>

And from and after the respective days next hereinafter mentioned:

On Sugar or Molasses the Growth and Produce of any other British Possession within the Limits of the East India Company’s Charter:

<table>
<thead>
<tr>
<th>Date</th>
<th>Duty Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>From and after</td>
<td>Candy, brown or white, double refined sugar, or sugar equal to double refined, per cwt.</td>
</tr>
<tr>
<td>5 July, 1847, to</td>
<td>Other refined sugar, or sugar rendered by any process equal in quality thereto, per cwt.</td>
</tr>
<tr>
<td>5 July, 1849, to</td>
<td>White refined sugar, or sugar rendered by any process equal in quality to white clayed, not being refined, per cwt.</td>
</tr>
<tr>
<td>5 July, 1850, to</td>
<td>Brown sugar, being Muscovado or clayed, or any other sugar, not being equal in quality to white clayed, per cwt.</td>
</tr>
<tr>
<td>5 July, 1851, to</td>
<td>Molasses, per cwt.</td>
</tr>
</tbody>
</table>

And from and after the respective days next hereinafter mentioned:

On Sugar or Molasses the Growth and Produce of any Foreign Country:

<table>
<thead>
<tr>
<th>Date</th>
<th>Duty Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>From and after</td>
<td>Candy, brown or white, double refined sugar, or sugar equal to double refined, per cwt.</td>
</tr>
<tr>
<td>5 July, 1847, to</td>
<td>Other refined sugar, or sugar rendered by any process equal in quality thereto, per cwt.</td>
</tr>
<tr>
<td>5 July, 1849, to</td>
<td>White refined sugar, or sugar rendered by any process equal in quality to white clayed, not being refined, per cwt.</td>
</tr>
<tr>
<td>5 July, 1850, to</td>
<td>Brown sugar, being Muscovado or clayed, or any other sugar, not being equal in quality to white clayed, per cwt.</td>
</tr>
<tr>
<td>5 July, 1851, to</td>
<td>Molasses, per cwt.</td>
</tr>
</tbody>
</table>

And also from and after the passing of this Act,:

On all foreign sugar or molasses not otherwise charged with duty, the duties following:

**C. s. d.**

<table>
<thead>
<tr>
<th>Sugar Type</th>
<th>Duty Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Refined sugar, or sugar candy, per cwt.</td>
<td>3 0 0</td>
</tr>
<tr>
<td>Brown Muscovado or clayed sugar, not being refined, per cwt.</td>
<td>2 0 0</td>
</tr>
<tr>
<td>Molasses, per cwt.</td>
<td>0 1 5 8</td>
</tr>
</tbody>
</table>

TARRANTUSIUS PATERNEUS, a Roman jurist, was Prefect of the importation under Commodus, by whom he was put to death. (Lampredi, Comm. 4.) He wrote four books De Re Militari, from which there are two excerpts in the Digest. He is mentioned by Vegetius (De Re Militari, 3.)

TARTASH TAGH, or TARTASH-I-LING, is the Turkish name for that mountain-system, which, by the Chinese, is called Thang-ling, and on our maps Bolor Tagh or Bolor Tagh is rendered. Proofs of this are to be seen in various distinctions between free-labour and slave-labour are abolished, the former duties on sugar and molasses are repealed, and the following duties levied:

**D. s. d.**

<table>
<thead>
<tr>
<th>Sugar or molasses</th>
<th>Duty Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Candy, brown or white, double refined sugar, or sugar equal in quality to double refined, per cwt.</td>
<td>5 0 0</td>
</tr>
<tr>
<td>Other refined sugar, or sugar rendered by any process equal in quality thereto, per cwt.</td>
<td>1 1 0</td>
</tr>
<tr>
<td>White refined sugar, or sugar rendered by any process equal in quality to white clayed, not being refined, per cwt.</td>
<td>1 6 4</td>
</tr>
<tr>
<td>Brown sugar, being Muscovado or clayed, or any other sugar, not being equal in quality to white clayed, per cwt.</td>
<td>0 1 4 0</td>
</tr>
<tr>
<td>Molasses, per cwt.</td>
<td>0 5 3</td>
</tr>
</tbody>
</table>
mentioned ranges are separated from each other. This place occurs near 35° 30' N., and between 74° and 75° E. long., between Chitral and Gilgit, where a high mountain-mass, the Tutacone Mutkala, rises to nearly 18,000 feet above the sea-level. About some thirty miles from this point the mountain-mass extends in a north-by-west direction to 40° 30' N., where its northern prolongation is known by the name of Kozur-urt; it lies between 70° and 71° E. long.

This mountain-mass is of great width, occupying the parallels above mentioned all the countries which lie between 70° and 75° E. long. But we are not exactly acquainted with the altitude of the mountains in the plains on the east and west, as these countries are very difficult of access to European travellers, a few of whom only have reached them. A great portion of these mountains appears to be elevated above the snow-line. This is especially the case with an immense snow-region, which occurs between 35° 30' and 36° 30' N., and which goes by the name of Puchikir. It is considered one of the most extensive snow-regions on the surface of the globe. North of this remarkable region is a depression in the range, in the middle of which is a large alpine lake, called Sir-i-kol, in which the river Oxus originates; it runs out from its western extremity. This lake is the first named place it follows the valley of the Sir-i-kol, or river of Kaghz to its source, then turns northward, passing over the crest of the Terek Tagh to Osch, in the valley of the Sir-i-kol, and crossing again the northern prolongation of the Bolor Tagh, it reaches Kound, and caravans pass along this road, and exchange the goods of Chinese Turkistan for those of Bokhara and the other countries of Turan.

(Elphinstone's Account of the Kingdom of Cabul and its Dependencies; Burnes Travels into Bokhara; Wood's Journey to the Source of the River Oxus; and Humboldt's Central Asia.)

TAXATION, LOCAL. There was published, under the direction of the Poor-Law Commissioners in 1846, a valuable work entitled 'The Local Taxes of the United Kingdom, containing a Digest of the Laws with a Summary of Statistical Information concerning the several Local Taxes in England, Scotland, and Ireland.' England includes England and Wales. It is remarked in the Introduction that 'these local taxes are of two kinds: the rates raised in defined districts; and the tolls, dues, and fees paid for particular services or on certain occasions. But those rates only will be here noticed which are authorised by general statutes or the common law: excluding such as derive their origin from special privileges.' The rates are divided into three classes:—I. Rates of independent districts, on the basis of the poor-rate. II. Rates of independent districts, not on the basis of the poor-rate. III. Rates of aggregation on the basis of the poor-rate. No. I. comprehends—1. The Poor Rate; 2. the Workhouse Building Rate; 3. the Survey and Valuation Rate; 4. the Jail Fees Rate; 5. the Constables' Rate; 6. the Highway Light and Litter Rates (three); 7. the County and Municipal Militia Rate. No. II. comprehends—1. the Church Rates (three); 2. the Sewer Rate; 3. the General Sewers' Tax; 4. the Drainage and Enclosure Rates; 5. the Inclosure Rate; 6. the Regulated Pasture Rate. No. III. comprehends—Counties: 1. the County Rate; 2. the Police Rate; 3. the Shire Hall Rate; 4. the Lunatic Asylum Rate; 5. the Burial Rate. Hundreds: 6. the Hundred Rate; 7. the Borough Rate; 8. the Watch Rate; 9. the Jail Rate; 10. the Prisoners' Rates; 11. the Lunatic Asylum Rate; 12. the Museum Rates. Counties and Boroughs: 13. the District Prison Rates.


The following statement is given in the work published under the direction of the Commissioners, as an approximate summary of the present annual amount of the local rate in England and Wales (p. 178):—

The Parish Rates:

Poor-rate, including the Workhouse Building Rate, and the Survey and Valuation Rate.
Relief of the Poor

Other objects

* The 3 & 4 Wm. IV. c. 52, the chief provisions of which are omitted under Sutras, P.C., was amended by 4 & 5 Viz., c. 263.
### TAX

<table>
<thead>
<tr>
<th>Contribution to County and Borough Rates</th>
<th>Tolls, Dues, and Fees</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Jail Fees' Rate</td>
<td>£1,531,818</td>
</tr>
<tr>
<td>The Constables' Rate</td>
<td>199,469</td>
</tr>
<tr>
<td>The Highway Rate</td>
<td>£870,457</td>
</tr>
<tr>
<td>The Light and Watching Rate</td>
<td>2,607,241</td>
</tr>
<tr>
<td>The Militia Rate</td>
<td>£82,097</td>
</tr>
<tr>
<td>The Church Rates</td>
<td>1,358,457</td>
</tr>
<tr>
<td>The Soot Rate, and the General Sewers' Tax—</td>
<td></td>
</tr>
<tr>
<td>In the Metropolis</td>
<td></td>
</tr>
<tr>
<td>In the rest of the country</td>
<td></td>
</tr>
<tr>
<td>Drainage and Incuriosity Rates, The Incuriosity Rate</td>
<td></td>
</tr>
<tr>
<td>The Regulated Pasture Rate</td>
<td></td>
</tr>
<tr>
<td>The County Rate</td>
<td></td>
</tr>
<tr>
<td>The Hundred Rate</td>
<td></td>
</tr>
<tr>
<td>The Borough Rate</td>
<td></td>
</tr>
<tr>
<td>Tolls, Dues, and Fees</td>
<td>£11,409,079</td>
</tr>
</tbody>
</table>

Some of the taxes are regularly increasing, and the produce of some, as appears from this table, is not known. It is assumed that the Local Taxation of England and Wales may be regarded as about that of the United States. The amount already shown, does not include the sums raised under special or local acts, of the amount of which some no estimate can be formed.

A century ago the poor-rate was about 700,000L; it is now about 7,000,000L. In 1818 it was 9,320,000L. But the sums levied under the name of the poor-rate are expended on various purposes besides the relief of the poor.

Under the direction of the Poor-Law Commissioners contains a chapter on the Local Taxes of Scotland, written at the request of the Poor-Law Commissioners, by J. Hill Burton, Advocate, Edinburgh.

The Local Taxes in Scotland are distributed by Mr. Burton under the following heads:

1. Administration of Justice, which includes Criminal Prosecution, Court-Rooms and County Buildings, Rural Police, Town Police, Prisons.
2. Internal Taxation, which includes Excision Roads, Turnpike Roads, Highland Roads and Bridges.
4. Civic Economy, which includes Direct Municipal Taxes, Petty Customs, Miscellaneous Burdens.
5. Relief of the Poor.
6. The Church and Education, which includes the Church of Scotland Education.
7. Miscellaneous Taxes.

Mr. Burton observes that the money expended on the ecclesiastical establishment and on education, parishes, in some respects, in the nature of a tax. The amount of money annually levied by local taxation in Scotland is not accurately known. The sum of 896,678L is the approximate amount given by Mr. Burton.

The local taxes in Ireland are distributed under the direction of the Poor-Law Commissioners:

1. Grand Jury cess (in all the counties, including counties of cities in Dublin, Cork, and Limerick, which give title to a bishop or archbishop).
2. Poor-rates (in 130 Unions, comprising every townland and denomination of land in Ireland).
3. Lighting, Cleansing, and Watching Rates (in all cities, towns, and boroughs which may adopt the provisions of the statute).
5. Pipe Water Rates (in every city and town, except Dublin and Cork, and Limerick, which gives title to a bishop or archbishop).
6. Parochial Cess (in all parishes, unions of parishes or chaires in Ireland).
7. Rates for deserted children (in all parishes in Ireland, except those in the city of Cork).
9. Rates by Health Rates (in parishes in which the lord lieutenant shall direct officers of health to be appointed).

### TAXY

The amount of annual local taxation of Great Britain and Ireland accordingly amounts to £14,197,046L. But it is observed that if the deficient information were supplied, it would appear that this amount exceeds 5,000,000L. It is observed, does not include the local taxes raised in particular places under special acts of parliament. The sum raised by general taxation in the United Kingdom for the year ended 5th January, 1846, was 51,713,182L. The amount of the local and general taxation is accordingly about 67,000,000L a year. The public expenditure for the year ending 6th January, 1846, was 49,961,412L, of which sum 29,805,572L was paid on account of the Funded and Unfunded Debt. This leaves somewhat under 21,000,000L for the rest of the general public expenditure. Accordingly the present amount of the local taxation, 15,000,000L, is nearly equal to three-fourths of the public expenditure after deducting the paymasters on account of the Funded and Unfunded Debt. It is well remarked in the work from which these facts are derived (p. 100): 'When the Local Taxes are brought under review in this collective amount, it then at once becomes manifest how really deserving of serious consideration are the modes of raising and expending them, so as to secure the most efficient and economical management of a revenue so important: a revenue, indeed, which derives its importance not only from the largeness of its aggregate sum, but from the extent of the property and the number of persons affected by it, and from the numerous and diversified public objects to which it is applied.'

### TAXICORNES

The second family of the heteromorphous coleoptera, in Latrellie's arrangement of insects. They have no common tooth on the inner side of the maxilla and labium. They are all winged insects with nearly square bodies, and a thorax which conceals or receives the head. They have short antennae and legs adapted for walking only. They live in the earth, but are absent of rocks, or other hard stones. This family is divided into two tribes, of which the genera Diaporus and Cossus are respectively the types.

### TAXITES

A coniferous fossil genus of plants from Stonesfield. (Brongniart.)

### TAXOCRINUS

The last generic name assigned by Phillips to the group of Eocrinoids analogous to Taxocretus (Poteroceratium) Egeriata. It has several synonyms. (Morris's Catalogue.)

### TAYLOR, WILLIAM

William, was born at Norwich, in the year 1765. He was the only child of an eminent merchant of that city. He first studied at a Swiss refugee, and afterwards at a Unitarian minister, at Palgrave, a tutor chiefly selected on account of his religious opinions, which were those of Mr. Taylor. He was better known as Miss Alkin, Taylor was indebted for much assistance in his early studies; aided by her sagacious care, he soon acquired a correct knowledge of the principles of English composition, and after life, he was gratified with his obligations to this celebrated woman, whom he styled the 'mother of his mind.' On leaving the house of Mr. Barbauld, at the age of fourteen, he was placed by his father in his counting-house at Norwich, who was desirous that he should succeed him in his large and prosperous business. Shortly afterwards he was sent on the Continent, under the care of one of the partners of the firm, for the purpose of perfecting himself in the French and Italian languages, which were of importance to the proper conducting of his father's business. Before leaving England, he had already evinced considerable facility in acquiring knowledge of languages; and he had been but a short time abroad when his letters to his parents, in English, French, and Italian, at the early age of fifteen, gave the promise of that eminence as a writer to which he afterwards rose. On his return to his native city, he was encouraged by his father, the prosecution of his studies, and the admiration of his parents and friends; and for the two years he remained there, he appears to have given the tone to its Literary circles. A second tour to the Continent was resolved upon; but, he proceeded to Germany, acquiring a familiar acquaintance with its language and literature. A residence of a year with a clergyman at Paderborn was sufficient for this purpose. The influence of his acquaintance in his rise by the taste not only for the literature of Germany, but for the philosophy of that country: a taste...
which ever afterwards characterized his writings. On his second return to Norwich, at the age of eighteen, his parents perceived in him too early, and a taste too decided for literary pursuits, to allow him to devote himself to the mercantile profession. The affluent circumstances of the father, added to the gratification which he expected to derive from the party to which he was about to be admitted, and the high distinction in letters, induced him to forego the strict performance of his project, and to put no restraints to add to his other distinctions that of being a prominent political character. The quiet of the study was now exchanged for the noisy meetings of political debating.

Taylor allowed himself to be enrolled as secretary of a democratic club established at Norwich. His political activity however, so far from interfering with his desire to obtain literary distinction, served as a stimulus to bring his writings before the public, and thus to extend his reputation beyond the narrow sphere of his native place.

A poetical translation of the 'Lenore' of Bürger was the first publication by which he became generally known. This translation, which preceded that of Spencer, still maintained its place among his literary works, and contains some variations from the original; that of the most importance being the liberty he has taken to transfer the scene of the poem, which in Bürger is towards the end of the Seven Years' War, to the times of the Crusades; in this he has been followed by Sir Walter Scott, to whom the public is also indebted for a translation of 'Lenore.' This work was soon after followed by several other poetical translations, which attained a large vogue, such as the 'Survey of German Poetry.'

The particular metre to which he has adapted many of these translations, and a familiarity and too familiar style of expression, have exposed him to some severe criticisms. In the year 1798 he became acquainted with Southey, whose political opinions in early life were similar to his own; an interesting collection of their correspondence will be found in the biography of Taylor, referred to at the end of this article. In one of them he describes his first interview with Sir James Mackintosh and Dr. Parr; and vividly, though not perhaps impartially, delineates their manner and personality.

Severe losses, consequent upon the war of the French Revolution, induced Mr. Taylor to retire from the management of his father's business; a circumstance which enabled him to give his leisure to the cultivation of his literary studies. Magazines and Reviews still continued to be the principal vehicles by which his writings came before the public. As a reviewer, he was remarkable for his close attention and extensive information on the subject he reviewed. Though not profound as a classical or an Oriental scholar, he in a great measure supplied his deficiency in that respect by his intimate acquaintance with the German translations and original works of the poets, and the commentaries upon them. The style, however, of his prose writings was so peculiar, that it was disapproved by many of his readers; and it became a source of constant altercation between Taylor and the writers of the Review. The titles he has contributed to Southey, 'I should say this man's style has an ambitious singularity, which, like chewing-gum, disappears at first, and is afterwards irksome.' He has also, it is said, attacked Shakspeare, 'He often sacrifice[s] felicity to curiosity of expression. With much philological knowledge, and much familiarity among the Shakspearean characters, the author has not the grace of his dialogue, and his allusions mostly pertinent; yet they have both an unsavoury which startles, and which, if ultimately approved, provokes at least an anterior discussion that is unnecessary.' A pleasing feature in the reviews of Taylor is the enthusiasm with which he entered into his subject, but which led him occasionally to hazard assertions which, on cooler reflection, he often disavowed. Thus it is stated that in one of his papers on the prose of Milton, he expresses the conviction that it is superior to his poetry.

In 1802, on a visit to Paris, Mr. Taylor accepted the management of a weekly local paper, 'The Norwich Iris,' after having used his endeavours to induce Southey to undertake it. This paper became the organ of the party to which he belonged; and his success here was not equal to his anticipations, and it was given up after two years. Then he applied himself anew to his reviewing labours, to the changes which had taken place in his family circumstances affording him an additional motive for literary exertion. The Monthly Review, under the editorship of Dr. Griffiths, was the work in which the greatest number of his contributions appeared. In 1806 he gave to the public his version of Lessing's 'Nathan the Wise;' which was severely criticized in the Edinburgh Review. A succession of pecuniary losses which soon occurred, rendered the position of Mr. Taylor's family, if not one of privation, at least of diminished comfort. His adversity, however, was cheered by the kindly sympathies of his numerous friends, and by several unsolicited offers of assistance, which, though not accepted, were sensibly felt and gratefully responded to. At the same time increase of years and premature infirmities diminished his energies, and his later productions have not added to his fame. Among his last works was a collection of short essays on English Synonyms, which, though incomplete and frequently fanciful, are calculated to assist the philological student, and to lay the foundation of a more complete undertaking. The last years of his life were devoted by him to the study of the species and the character to whom he had proved himself a devoted and affectionate son, and by the decay of his mental powers. He died in the month of March, 1838; his remains were deposited beside those of his parents, in the cemetery of the Octagon Chapel at Norwich.

Mr. Taylor's chief claim to literary celebrity consists in his valuable translations from the German; it was through him that the English first became acquainted with the German literature of Germany. If his talents as a poet were unequal to the task of producing such a translation as the Wallenstein of Coleridge, to him at least must be assigned the merit of having been the first in the field, and perhaps to have laboured in it more assiduously than any other English writer. A good translation does not only require a perfect knowledge of the two languages, but also the power of approaching in some degree to the style of the original. Hence in poetical translations it is necessary that the translator should be a poet also. 'We know,' says a high authority on this subject, 'the remark of Denham, that the sublimity of petty evaporation entirely in the transmutation from one language into another; and that, unless a new or an original spirit is infused by the translator himself, there will remain nothing but a 'captito mortuam.'''

'This transmutation must always be those who have approved their talents in original poetical composition.' (Tyler's Essay on the Principles of Translation, p. 573.) These remarks will account for the chief and perhaps only defects of Taylor's translation. 'Memor of the Life and Writings of the late William Taylor, of Norwich, &c., by T. W. Bobbidge, F.G.S., of Norwich, 3 vols. 8vo., London, 1843; Quarterly Review, vol. LXXIII. p. 27-98.'

TECO'MA (from Tehocaxochitl, the Mexican name of the species), a genus of plants belonging to the natural order Bignoniaceae. It has a campasula 5-toothed calyx, a short-tubed corolla with a campanulate throat, and a 5-lobed bicipitate limb, four didynamous stamens with a sterile filament of a fifth, a bilacinate stigma, a siliqua-formed 2-celled capsule having the dissepiments contrary to the valves; the seeds are flat, the flowers distributed in umbels, and the shrubs or scendent plants, with unequally pinnate or digitate simple leaves with terminal panicled yellow or flesh-coloured flowers. They are natives of the Old and New World in tropical and subtropical climates. They are all elegant plants and well worthy of cultivation.}

T. radicans is a climbing glabrous plant with rough rooting branches, its whitish, acuminate leaves, its racemes of flowers terminal corymbose on long peduncles, the tube of the corolla 5 times longer than the calyx. This is a hardy plant in our climate. It is a native of North and South Carolina, of Florida and Virginia. It is planted as a great favourite in this country. It grows against a wall by throwing out roots from its branches in the same manner as ivy. The flowers grow from the ends of the branches in large
bunches, and the tube of the corolla gradually swells out in the form of a trumpet; hence this and some of the species of Bignonia have been called trumpet-flowers.

*T. siams* is a small tree with somewhat tetragonal glabrous branches, bearing acuminate, alternate and glabrous leaves, the racemes terminal simple. This plant is a native of various parts of South America, the West Indies, and Mexico. The roots of this plant are reputed diuretic drugs, and several other species of Tecoma have reputed medicinal virtues. *T. species* is said to be a useful diuretic, also a cathartic. *T. impetiginosa* and *T. ipe* contain large quantities of tannin, and decoctions of the bark are used by the Brazilians as external applications in rheumatism and a gargar in ulcers of the throat. The leaves are mild and are employed in affections of the eyes. In cultivation the species of Tecoma may be treated in the same general way as recommended for the species of Bignonia. (BIGNONIA, P. C. S.)

(Lindley, Vegetable Kingdom; Don, Gardener's Dictionary.)

TEESDA/LIA (named after Robert Tressdale, author of a catalogue of plants growing about Castle Howard), a genus of plants belonging to the natural order Cruciferae and the suborder Angustifoliate. It has a roundish notched pachy, boat-shaped valves, thickly keeled below, narrowly winged above; the seeds two in each cell, the petals either equal or the two outer larger. The species are small annual smooth herbs with stalked expanded vertical leaves. The flowers yellow, with calyx lobes free.

*T. rubicida* is the *T. Herba* of De Candolle. It has unequal petals and numerous leaves spreading on the ground. The stamens with remarkable scales within, the pouch emerging in the lower calyx and the shorter flower in England, France, Germany, Denmark, and Sweden. It is the only British species.

*T. lepidum* is a native of Europe, particularly of Spain. It differs but little in general characters from the former species, there are two varieties of it.

If the seeds of these little annuals be sown on rockwork or in dry sandy places they will scatter themselves and increase rapidly.

(Ton, Gardener's Dictionary; Babington, Manual of British Botany.)

TELEGRAPH, ELECTRIC. The electric telegraph, although it has only begun to attract the attention of the public from a comparatively recent date, has nevertheless not originated in any sudden but happy idea. The possibility of such an application of electrical power has long been imagined; and from the commencement of the present century, the attempts to render one or other of the phenomena of electricity subservient to such a purpose, have been numerous and of various forms. We shall here briefly some of the most remarkable of these inventions, of which any authentic account exists. We have arranged them as far as possible, in their proper order of succession, down to the present time. In the new world, in the form which which is now present in England; omitting those subsequent stages of the invention, which have related rather to the improvement of details, than to the adoption of any new principles of construction.

With this subject the Electric Clock is so far interwoven, that we have introduced a short description of its mode of action.

From the earliest date which we can assign to the existence of an electric telegraph, its essential parts have been the same. These are, the source of electrical power; the conducting material by which this power is enabled to travel to the distant place; and finally, the apparatus by which, at the distant end of the line, the existence of this power, its amount, or the direction of its action is made known to the observer. In the earlier stages of the invention, the investigator and its promoters were confined to the latter of these three essentials; and so long as the illustration of the idea was confined to the lecture-table of the philosopher, or to the select museum, this part just claimed an undisputed pre-emination. But with the improvement and application of the principle to purposes of general utility, there arose the necessity for an equal, nay, almost for a greater degree of attention to the other requisites. We shall, in our brief survey of the history of this invention, how this fact develops itself.

The experiments of Dr. Watson and others, about the middle of the present century, led to the discovery of electrical phenomena which Franklin mentions having been exhibited on the banks of the Schuylkill, at the same period, may possibly have suggested some notions of the conveyance of information, by means of electricity. The earliest authenticated instances of the use of electricity to produce this effect is said to have been that of Mr. Loomond, in 1787. His apparatus was, however, of the simplest possible construction. He employed, as an indicator, a pair of pith balls, which were suspended from one end of a piece of fine insulating wire, the other end of which the operator took his station, provided with an electrical machine. On charging the wire with electricity, the pith balls would exercise mutual repulsion, and diverge from one another; this was the instrument and by the action of some conductor, the balls would collapse. It is evident that certain numbers of successive divergences might be made to denote particular preconcerted signals. No account is, however, preserved of the manner in which the inventor intended to apply these indications. Subsequently to this, the phenomenon of the spark was used for the transmission of signals. It is well known that on the passage of electricity through an interrupted conductor, a brilliant spark of light is seen, at all the breaks in the continuity of the conducting material. This fact is well known in its application to various electrical toys in the present day. We allude to the outlines of birds, animals, or stars, which are formed of small pieces of tinfoil, attached to plates or strips of glass, at such distances asunder, that an electrical charge may be readily passed through the whole. When this is done, the figure becomes luminous for an instant, and the sparks leap across the small intervals between the successive pieces of tinfoil. Were the various letters of the alphabet formed in this manner, upon a table, and connected each one with a distant conductor, we should be able to send visible signals observed visible in a darkened room, by passing an electrical charge through the appropriate wire. This in fact constituted the Telegraph of Reiner, invented in 1794.

A somewhat similar form of apparatus, involving the same principle, was constructed by arranging the several wires in succession, with a single break in each. The various wires bore the names of the different letters or figures, and any required signal was indicated by passing the charge through the proper wire, when the spark visible at the interruption of the circuit would denote the letter to the observer at the farther end.

This was the point to which the invention had progressed, at the commencement of the present century. The discovery by Volta, of the battery which bears his name, forms the commencement of a new era in electro-telegraphs, although no immediate application of the phenomena of the galvanic current appear to have been made. One or two points present themselves for our consideration, before proceeding to the latter period.

In reference to the relative adaptability of the electricity derived from the ordinary machine, and that from the Voltaic battery, to the purposes of electric telegraphs, we may add a few words, in the form which which is now present in England, omitting those subsequent stages of the invention, which have related rather to the improvement of details, than to the adoption of any new principles of construction.

With this subject the Electric Clock is so far interwoven, that we have introduced a short description of its mode of action.

From the earliest date which we can assign to the existence of an electric telegraph, its essential parts have been the same. These are, the source of electrical power; the conducting material by which this power is enabled to travel to the distant place; and finally, the apparatus by which, at the distant end of the line, the existence of this power, its amount, or the direction of its action is made known to the observer. In the earlier stages of the invention, the investigator and its promoters were confined to the latter of these three essentials; and so long as the illustration of the idea was confined to the lecture-table of the philosopher, or to the select museum, this part just claimed an undisputed pre-emination. But with the improvement and application of the principle to purposes of general utility, there arose the necessity for an equal, nay, almost for a greater degree of attention to the other requisites. We shall, in our brief survey of the history of this invention, how this fact develops itself.

The experiments of Dr. Watson and others, about the middle of the present century, led to the discovery of electrical phenomena which Franklin mentions having been
once; or by so nearly completing the circuit, that the electricity may leap across the interval in the form of a spark. When we present ourselves in a circuit by connecting an electrical machine to make a spark from it, the mode of completion of the circuit is less apparent, though the necessity for it is not less absolute. The body in fact forms the communication between the two ends, or poles of a Voltaic battery respectively, no indications of the passage of the electric fluid through either can be found. But if the wires be brought in contact at any point, or if a sufficient pressure be exerted to complete the circuit, the passage of the fluid from one pole of the battery to the other through the extended wires will take place immediately. If this connection be made at any distant point, by an apparatus fitted for such inducements, the direction and amount of the current may be appreciated, as certainly as they could be, were the circuit completed between the battery poles by this apparatus only. To use the words of the late Professor Daniell, the journeys of this force must be in a circle, and the arrangements must be made in such a way, that the impulse may return to the point from which it set out; it must circulate. It will be seen how important were numerous experiments upon the construction of the electric telegraph.

We may now return to the point whence we have digressed at so great a length. In 1807, Sömmering at Munich proposed to construct an instrument for decomposing water by the Voltaic current, as discovered in 1800 by Nicholson and Carlisle. The form of his apparatus was the following:—In a glass trough containing water, thirty-five gold pegs or pins were arranged vertically, this number of pegs corresponding to the letters of the alphabet, together with the nine digits. Each of these pins was connected with a wire, which extended to the place whence the signal was to be received. At the terminations in brass strips, arranged in a frame side by side, like the wires and pins, insulated from each other. Each brass strip bore the name of the letter or figure which belonged to the pin to which it was connected. The operator, when wishing to send any communication, connected the two poles of the battery, with the brass strips bearing the names of the two first letters required. Decomposition of the water in the trough at the distant end, was instantly indicated by the evolution of bubbles of gas, from the two gold pins thus rendered the two electrodes or poles of the battery. The letters forming any communication were to be in this manner denoted in pairs, the inventor ingeniously availing himself of the different quantities of the two gases evolved, to point out the relative position of the letters in each pair. The hydrogen which made its escape in the largest quantity was always employed to indicate the lower; and the lower strip corresponded to the lower. It is incumbent upon us, however, to bear this rule in view in making his connection with the battery.

In 1816, Mr. Ronalds of Hammersmith invented an electric telegraph, in which he recurred to the use of frictional electricity. This telegraph, which was shown to several scientific men, at the date above given, was fully described by the inventor, in a work published by him in 1823. Mr. Ronalds employed the divergence and collapse of a pair of pit-balls as the telegraphic indication, in which respect the principle was the same as that adopted by Mr. Lomond; but to this simple apparatus, a distinct contrivance was appended, which would render the needle more rapid and easy. A single wire perfectly insulated by being suspended from silk lines, or buried in glass tubes, surrounded by pitch, and protected by wooden troughs, was extended between two stations. From the end of this wire were suspended in front of the dial of a clock a pair of pit-balls, so that while the wire was charged the balls would remain divergent, but would collapse into a state of union after the Voltaic current from earth, or with the hand of the operator, was discharged. A person at one end, having therefore an electrical machine, by which he could maintain the wire in an electrified state, and thus become the communer of a signal of divergence; had it of course in his power to give an instantaneous indication to an observer at that farther extremity by touching the wire with his hand, which, discharging the electricity, would allow the balls to collapse for an instant. But instead of merely employing the successive movements of the pith-balls to denote the various signals, Mr. Ronalds added another apparatus for this purpose. Two clocks, very accurately adjusted, so that they had nothing going, carrying, instead of the ordinary seconds hand, light discs, or mosaic letters of the alphabet, the figures, and other required signals were engraved. These discs turned with a regular step by step movement, and when the hand of the watchman in a small opening, sufficient to allow of one letter at a time being seen. As the discs turned round, each letter in succession would be visible through this space; and it is evident that if the clocks were started with the same signal visible, the movement of the discs would bring similar signals into view at the same time. One of these instruments was situated at each end of the communicating wire. The operator who was about to transact business with the person at the other end of his clock until the letter he required was visible, and at that instant discharged the wire. The momentary collapse of the balls at the distant end then would warn the observer to note the letter visible on his instrument, which would form a part of the intelligence to be received. The successive letters or signals constituting any message were denoted in this manner as the clock discs continued to turn round. In order to avoid the necessity for constant attention on the part of the observer, an arrangement was adopted by which a pistol could be fired by the spark at the further end, to summon the attendant to his instrument. Various signals were also concerted beforehand by the use of which arrangements were made for the transmission of any intelligence was lessened. These experiments of Mr. Ronalds were made with the intervention of several miles of wire, carried backward and forward across his grounds, on his own grounds, and his ground.

Mr. Ronalds, in his work on electricity, published in 1823, informs us that an electric clock was constructed in 1815 by Buzengeiger. A very light pendulum was suspended, with its bob or weight midway between two brass balls, forming the extreme ends of a De Luc's Pile. Having been once set in motion, the pendulum would continue to oscillate between the balls, receiving at the end of each vibration an impulsion, from the attraction of the bodies which it had just touched. The upper end of the pendulum was made to cause the revolution of a small ratchet wheel, by means of the alternate action of two catches, or pallets, one on either side of the wheel. To many of our readers the construction and action of the Dry Pile or column of De Luc may be familiar. It may not however be amiss to add, that it consists of many hundreds, or even thousands, of small discs of silver and zinc foil, piled up in regular orders, with the intervention of writing-paper discs between the succeeding pairs. They are then usually enclosed in a glass tube, and pressed firmly together, by means of screw-caps or ends of brass. The ordinary hygroscopic moisture of the air is sufficient to excite weak voltaic effects in the pile, which are manifested by the two ends exhibiting constantly opposite electrical states. The bob of the pendulum in Buzengeiger's apparatus, at the end of the De Luc column, would therefore acquire a small charge, which would be transmitted to the pendulum in the next order, the second pendulum, in the same manner, taking on the opposite charge, and so on in succession throughout the whole pile; in consequence of which it was repelled by this ball, and attracted by the other. These actions, though very feeble, are long continued, and might suffice to maintain a movement of the pendulum for a very long time. This is the principle on which the opticians' windows at the present day, slender frames are often seen revolving, with paper figures of chariots and horses, under the influence of two or more of these Dry Piles.

In 1819, Professor Gersted of Copenhagen made his great discovery of the action of the galvanic current upon a magnetic needle. He observed that when a galvanic current is passed along a wire, placed parallel and near to a magnetic needle, free to turn on its axis, the needle is deflected to one side or the other, according to the direction in which the current is transmitted. He further noticed that the position of the wire, whether above or below the needle, had an equal influence with the direction of the current in determining the side to which the deflection took place. The power of a single wire in causing this deviation of a needle is very small, but when a whole Volta's pile is employed. Truefitt and Schweiger invented the multiplier, as he called it, in which the needle, being surrounded with many successive coils of insulated wire, is acted upon by the joint force of all. This instrument, constructed by Truefitt and Schweiger, has of the most signal use to the philosopher; it

* Ronalds' Description of an Electric Telegraph, &c., p. 49. Translated from the Edinburgh Review, September 2nd, 1815. In the same work (page 171) Mr. Ronalds, quoting the Journal of the Society of Arts of 1821, states that Mr. M. Ramsay at Manchester, and Mr. Brewe at York, had each constructed an Electric Clock, which received motion from a Dry Pile.
enables him by its extreme delicacy not merely to discover the existence of feeble currents, but also to measure their force and direction with extreme accuracy. Under a microscope, this discovery now forms the basis of the Electric Telegraph, which has spread so extensively over England.

Not shortly after this important discovery had been made, Gossard, Arago, Davy, and others, succeeded in rendering iron magnetic, by the passage of a galvanic current through a wire coiled around the iron. It was found that, provided the iron to which the current was applied for any length of time had magnetic property remaining only during the actual transmission of the electricity, and was lost immediately on the interruption of the electric circuit. If the iron which was exposed to the influence of the current was an iron, steel, lead, sand, charcoal, or phosphorus, the magnetic power became to a greater or less extent permanent in it.1

These two principles have, since their discovery, formed the groundwork of almost all the electric telegraphs which have been proposed, and certainly of all which have hitherto been found practicable. Far be it from us, however, to assume that these principles must henceforward bound the inventive genius of men of science, or that no further progress can be made. Much has been already done, but far more, as yet latent and unknown, may be before us.

M. Ampère suggested the employment of the discovery of (Ealing, 1836), and this suggestion was adopted and carried out by Professor Ritchie, in a model Telegraph exhibited by him at the Royal Institution.2 Ampère's plan however was far from possessing the simplicity, so essential in an instrument of that kind, as is generally supposed. Not only were conducting wires necessary, according to his scheme, for maintaining a Telegraphic communication.

M. Schilling also in 1839, following the ideas suggested by Ampère, proposed a similar form of telegraph, in which there were as many of these galvanometers, each with its appropriate circuit, as there were letters or signs to be used in the various communications. The momentary deflection of any one of these needles was quite sufficient to convey a message, with its denoted letter or sign. The same plan, to a certain extent, seems to have been followed by M. Alexander, in his Telegraph, described about the end of the year 1837. In this instrument a distinct needle was employed for the indication of each letter, as in M. Schilling's apparatus, these needles bearing at one end light screens of paper, which concealed from view a letter or figure, until by the deflection of the needle the screen was removed, and the letter brought into sight. M. Alexander however effected one great improvement, in substituting a single return wire, to which every end of all the coils was joined for the several distinct return wires existing in the previous invention of M. Schilling.3 At a later period this latter gentleman undertook a series of experiments, with a view to the establishment of a communication by means of insulated wires, which he thought the mechanical difficulties present in the accomplishment of his design had arrested his progress, previous to his death, which occurred while he was engaged in the prosecution of his investigations. In both of these telegraphs all that was required, in order to convey the indicating apparatus, and conducting wires, was a contrivance by which the connection of the voltaic batteries could be made with any pair of wires in the former, and with any single wire and the return-conductor in the latter of the two inventions. In M. Alexander's Instrument, a set of keys resembling those of a pianoforte, and corresponding to the number of needles, were arranged on a frame or table. One pole of the battery being connected to the return or common wire, the other pole was joined to a plate of metal, or to a trough of mercury, extending beneath all the keys. On depressing any key, the wire belonging to it, which was continued to the end over the battery connection, was brought into contact with the common wire, and thus the whole current would thus flow along the conducting wire, around the multiplier-coil in the distant instrument, and return by the common wire to the voltaic battery. The keys bore the same letters as the needles to which they were connected, so that the operator communicated any letter by pressing down the corresponding key.

In these two instruments no use was made of the power which exists, of determining the deflection of the needle, by applying it to another instrument. Under a microscope, this discovery now forms the basis of the Electric Telegraph, which has spread so extensively over England.

In a telegraph recorded as the invention of M.M. Gossard and Weber, the varied deflections of a single needle appear to have formed the code of signals. From the use of the telescope, however, so readily applicable to a long line of communication. The telegraphic instrument shown in the drawings annexed to their specification, and which was brought into use on the Great Western Railway shortly after the patents were obtained, consist of five needles, arranged with their axes in a horizontal line. The needles when at rest hung vertically, by reason of a slight preponderance given to their lower ends. Each coil was connected with one of these needles, and the ends of the wires united at the other with a common rod of metal, which joined together the similar ends of all the coils. The current was transmitted from the opposite end of the wires (where the resistance is in a good proportion great) to the conductor of the battery. The receiving needle, a second wire being brought into contact with the other pole, the current returned by the rod of metal connecting the coils and the second wire to the battery again. Two needles were used in this manner as plates, the needle as a galvanometer. By this means one or other of the pair of keys belonging to each needle was depressed. Fixed stops were placed on each side of the needles as to limit their motion, and when resting against them, the needles were parallel to two converging lines, at the point of intersection of which, a letter was placed. This was the signal indicated by the movement of the needles. In a similar manner, as before was drawn diverging from the centre of each axis, mutually crossing one another, a number of points of intersection were formed, at each of which was a letter or signal. Any of these letters could be indicated by the simultaneous deflection of any of these needles. The operator's communication could be carried on with rapidity and certainty.

At the same time a plan was recognized, by which the number of wires required for maintaining a communication might be considerably diminished, and at the same time return wire only, there being no needle in connection with this one. One needle could by the use of this wire be deflected by itself either to the right or left, and thus of course each would furnish two signals, in addition to those formed by its simultaneous deflection with any other. The instruments at the two stations were always rendered reciprocating; that is, at each

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1 Thomas' Lectures on Heat and Electricity, p. 512.
2 In this and other parts of this article, when treating of the transmission of electric currents, it will be necessary to simplify the description, to represent the electricity as starting from one end or pole only; and, returning after its circuit to the other. Theory however warns us not to allow even this extreme simplification to be carried too far; and, in order to act upon the experiments, to be described in future, it will be necessary to suppose the force developed at once at both ends of the battery, than to any power acting in one direction only.

3 Mr. Crosse is invited to the kind gentleman to the great man, whose profound and successful researches had already prepared the way, to receive it as a project capable of practical application; it is to the talented gentleman whose name is appended that belongs the credit of the discovery, in which he may well claim to share the honor of the great man, whose profound and successful researches had already prepared the way, to receive it as a project capable of practical application; it is to the talented gentleman whose name is appended that belongs the credit of the discovery, in which he may well claim to share the honor of the great man, whose profound and successful researches had already prepared the way.
end of the line were placed an instrument, a set of finger-keys, and a voltaic battery, so that either station could transmit or receive a signal. By a beautiful arrangement, the keys, on being released after depression, were made to return by themselves to the position necessary to enable that which had been the signalling station to become the recipient. By this means messages and answers, or words and their acknowledgments, could follow one another without the necessity for any intervening instrument or arrangement.

The bell or alarm which was to be rung, when the attention of the clerk at the distant terminus was required, was operated by a deflection of power. It was by an attraction exercised by a horse-shoe piece of soft iron, rendered temporarily magnetic by the galvanic current, was made to draw an armature, likewise of soft iron, towards it, and to cause a small bell to ring by connecting a bell. In the second form of alarm, the movement of the armature merely released a detent or catch from a train of clock-work driven by a spring or weight. This clock-work, by the inter-

vention of a scope-wheel and pallets, rang the bell in the manner well known in common alarms.

In the early part of 1833 Mr. Cooke obtained a patent for some further improvements of this apparatus. Of these the most prominent was the mode of introduction of the intermediate apparatus. Before the date of these patents, the two stations at the extremities of a line of telegraph had alone been put in communication with each other; but Mr. Cooke devised means whereby the messages might be introduced between the two terminals, and any intelligence rendered simultaneously visible in all or in any of them, as required. Furthermore any one of these instruments could be placed at the station, or by another to another part only; and by an admirable contrivance, the same mechanical adjustment which limited the connection of any intermediate instrument to one part of the line, placed its bell in the circuit of the other. This intelligence was being transmitted in one direction from an intermediate station, some message of importance were required to be sent from the terminal, or any other station on the excluded side, the end of the line, the current in that instrument was to warn the attendant to restore his instrument to its intermediate position, and thus leave the line clear throughout.

In the same patent were included some important improvements on the mode of protecting and insulating the wires, which were to be laid beneath the earth, in troughs or troughs of wood, iron, earthenware, or other material; and also in the expedients for detecting the exact position of any accident or derangement, without the necessity of uncovering the whole length. Two needles were also shown to be sufficient for carrying on a complete communication with ease and rapidity.

In the course of the ensuing year (1838) Messenger Cooke and Wheatstone, having added a circuit of about one hundred miles to the Great Western Railway, where its capabilities were tested severely. The results of this trial were most gratifying to the inventors, and demonstrated that the understanding, yet delicate and easily induced from a current of galvanic electricity, the question of the practicalities of the electric telegraph, so long at issue among scientific men, was set at rest for ever. Within less than two years from the date of the existence of the invention of Messrs. Cooke and Wheatstone, the severe test of practical application was borne, not merely without lessening the value of the invention, but in a manner which justified increased admiration in those who witnessed the experiments.

We must here go back a little, to take notice of Dr. Stein- heil's telegraph, which was erected between Munich and Bo- genberg. The conductor was a magnet; a pair of metallic bars were placed within an elongated coil of fine wire. These bars were suspended on axes passing transversely across the coil, and in their quiescent position lay parallel to one another and to the straight wire to which they were connected. The ends were ground or sharpened so that when a current was transmitted along the wire, they had a tendency to move in the same direction, remaining still parallel to each other. Against the outer end of each needle or bar was fixed a contact of steel, which when in contact with a magnet, the pencil would continue to trace a straight line as the paper moved onwards; but on momentarily making the circuit with the battery, the armature was drawn to the electro- magnet, and the pen raised by the spring, so as to make an angular mark, like the letter X reversed, on the paper.

These magnets either being joined in groups, by rapidly succeeding completions of the circuit, or they might be separated by a short or long distance, the points at which the magnets were represented by corresponding numbers of angles, and these were combined so as to form all possible numbers. A short space intervening between two or more successive groups, denoted that they were to be taken together, were represented by two or more places of digits; while a longer space showed the actual completion of one number and the commencement of the next. All the necessary words were represented by various numbers, as arbitrary signs, and were arranged

[Note: The rest of the text is not visible in the image.]
dictionary being used for their interpretation. This plan had also been proposed by Mr. Ronalds, to simplify the working of his telegraph.

The plan was erected by Prof. Morse, in 1844, between Baltimore and Washington, a different mode of recording the signals was adopted. The use of the pencil was found objectionable, from its so frequently requiring fresh pointing, and frequently becoming illegible. The arrangement was retained in regard to the paper, but it was made in its course to pass under a roller having a groove around it. The long arm of the lever carried a blunt steel point, standing out from its upper end under the groove in the roller. When therefore the arm of the lever was elevated, by the attraction of the magnet upon the armature, the steel point pressed the paper into the groove, and produced an indentation. If the attraction were momentary, a depressed point was produced; but if the action were continued for a longer time, a lengthened depression was the result, as the paper was drawn on. The combinations of these two kinds of marks denoted the various letters and figures.

In his first instrument, Mr. Morse produced the requisite groups of angles by means of type having as many projecting ridges or teeth as there were to be angles. These being arranged in a frame, as required for the message, made the successive contacts with the battery as they were drawn under a lever or spring. Subsequently however a single key was introduced, by which the longer the circuit might be completed when necessary. The first plan had the advantage of requiring no exertion of memory on the part of the operator, after the message had been set up properly; but nevertheless, the second, in which all depended on the skill and recollection of the person transmitting any signal, was preferred.

In the year 1837 Mr. Davy of London obtained a patent for an electric telegraph. The actual principles of his invention were three: first, the employment with each wire (of which three were to be used) of two magnetic needles, each movable in one direction, but stopped in the other, in a manner analogous to that in Stehlin's telegraph; secondly, the use of a supplementary battery, to effect the registration of the signals, the connection of this second battery being made by the deflections of the needles; thirdly, the method of registering or recording the various communications, by causing the current of the supplementary battery to pass through a ribbon steeped in a solution of iodine of potassium and starch. The salt being decomposed by the current, a blue spot was produced by the combination of the iodine with the starch, and the position of one or more of these spots across the breadth of the ribbon, determined the nature of the signal transmitted. The action of the two needles in each circuit was similar to that of the beam in Dr. Stehlin's telegraph, in respect to their alternate deflections, according to the direction of the current. Instead however of carrying a cup for ink, each needle bore a small metallic arm on its axis, which needle was directly under the circular fixed stop, came in contact with a brass pin or stud, and thus completed the circuit of the supplementary or registering battery. The stud belonging to each needle was connected with a piece of india-rubber tubing, by which the inscriptions was asunder around a light drum. The edges of these rings bore lightly upon the prepared ribbon, as it passed over a metallic cylinder driven by a weight and cord. Instead however of allowing the ribbon to move at a uniform speed wholly independent of the rate of signalling, Davy ingeniously connected the two parts of the apparatus together, by such means that the movement of each needle caused the revolution of the cylinder bearing the ribbon through a small space; so that the successive registrations forming any communication were placed at regular intervals apart upon the fabric. This was done by introducing a small electromagnet into the circuit of the registering battery, so that whenever this circuit was completed an armature was attracted, and one tooth or division of the cylinder released from a catch or pallet. This tooth was divided into squares by transverse and longitudinal lines, in such a manner that each platinum ring pressed upon the fabric, in the centre between two longitudinal lines, while the space through which the armature was moved, at each division, corresponded to one of the transverse divisions. Thus successive squares were brought in turn under each ring, as the ribbon passed onwards, receiving the registrations as it moved. If we now suppose the cylinder to be connected with the metallic cylinder bearing the cloth, and the other with the axes of all the magnetic needles, the action of the apparatus will be readily rendered apparent. When a current was transmitted from the communicating station, so as to cause the deflection of the first needle of the first wire, the second needle of the same wire then being pressed against (its stop and fixed), the arm of this needle coming in contact with the brass pin or stud, would complete the supplementary circuit, thus allowing the current to pass through the upper arm of the second needle to the registering battery, in connection with the needle axis, it would pass from the axis of the deflected needle along its arm to the brass pin, thence to the first platinum ring (or radius); then through the other needle (second course) to the metallic cylinder, and to the pole of the battery, joined thereto. When the current from the signalling station reached the detector, the second, or parallel supplementary circuit formed with the second platinum ring, and so on with the others. After each signal the ribbon would be advanced one division, so that the successive registrations would take place in succeeding transverse divisions of the fabric. The person who is to communicate has an apparatus, in which, by depressing different keys, he can transmit the electricity in one or other direction through any wire, making it return either by a separate wire or by the earth; or he can employ another of the signalling wires to return the current. In the first case, he would produce a single spot on the ribbon from one ring only; while in the second, spots from two rings would be produced, the direction of the current being determined by the various simple and combined indications, a sufficient number of variations to express the necessary letters and signs could be obtained.

In the year 1840 Professor Wheatstone patented his electro-magnetic telegraph, in which the indicating power was the magnetisation of soft iron by the electric current. The object of the invention was to produce, by excitation and demagnetisation of the magnetic particles of soft iron, certain definite and definite movements of rotation, in dials or indicators; by which movements signals might be given, of various kinds and in various modes. The first part of the apparatus was a semicircular plate composed of a disc of wood, turning horizontally upon a pillar or axis, has its circumference divided into equal spaces, alternately filled up with metal or ivory. The metal divisions communicate with the central column, and through it with one pole of a battery, of which the other pole is connected with the return wire or with the earth. Against the circumference of the disc rests a spring, from the foot of which proceeds a wire going to the line or long conductor. As the disc is rotated from its centre, the spring rests alternately on metal and ivory, and were there no break in the circuit at the distant station, the current from the battery would be transmitted or intercepted. The operation of the apparatus according to this principle is placed a letter or figure, so that by bringing one letter after the other opposite to a stop fixed near the disc, the galvanic circuit would be opened and completed alternately with each succeeding letter or figure. Away turn of the disc, which is provided with spokes or arms radiating around its upper surface: The telegraph which is operated upon by this Communicatory, possesses great simplicity both in its principle and construction. One of the main features of the apparatus is that the voltaic magnet is placed a small armature of soft iron. When the iron is rendered magnetic the armature is attracted to it, but on interrupting the galvanic circuit the magnetism of the iron ceases, and a small revolving spring throws the armature back to its original position. The armature itself turns on an axis, which carries a pair of pallets, making into the teeth of an escamplon wheel. In the instrument first constructed according to this patent the recurrences of the attraction and release of the armature actually formed the motive power of the machinery, the two pallets alternately removing the moving escapement wheel, and the pallets, actuated as above, merely holding the cam that controls the movement of the clock. In either case the object was the same, that is, to communicate to a light paper or mica dial, bearing letters around its circumference, a step by step motion, wholly under the control of the current of electricity, so that the operator might bring any figure or letter on the dial to a small opening in a screen, through which it would be visible to an observer. The number and order of the signals upon the paper disc corresponded with those on the Communicatory previously described. Supposing for instance that the letter A were
opposite to the fixed stop in the Communicator, and that the same action which brought the various things into the presence of the telegrapher; if while in this position the spring of the telegrapher rested on an ivory division of its circumference, no current would pass from the battery. But if the commutator resting on an ivory division, similar to the strife of the escape-wheel pass, and the following signal B would appear through the opening in the screen. The movement to C on the communicator, breaking the circuit, would release the armature of the type-disc, and the cylinder did not turn on a simple axis, but on a screw; so that the words of any communication were arranged in spiral lines around it. When the paper was unwrapped, to be replaced by a fresh piece, the message would be found printed in slightly sloping lines from one side to the other. The action of this instrument was very perfect, and it appeared to possess every requisite which could be demanded in a registering telegraph. There were no obvious impediments to its being brought into use, in the increased cost of the apparatus, and the slowness with which signals would be rendered, as compared with the needle instrument.

Towards the end of 1840 Mr. Bain, in conjunction with Mr. Barwise, patented a clock which was to be set in motion by the pressure of the inventors to employ the magnetic power of the pendulum, in conjunction with the pendulum of a clock, at the end of its oscillations, in the following manner:—An electro-magnetic coil formed the bob of the pendulum, and its movement was connected with the end of two permanent magnets, when at the two extreme points of its swing. On reaching these points, the pendulum itself, by coming in contact with a slender spring, completed the circuit of the galvanic current through the coil, in such a manner that the end of the coil then nearest to the magnet on the side to which the pendulum had oscillated, was momentarily endowed with the same polarity of the coil and magnet, and the former, being free to move, recoiled from the latter with a small impulse, sufficient to carry the pendulum to the opposite end of its oscillation. The same effects then took place, in respect to the other fixed magnet at that side. A small force was thus communicated to the bob of the pendulum, at each extremity of its arc, which was sufficient to maintain its vibrations undiminished; and at the same time to put in motion, by means of the ordinary arrangement of a scape-wheel and pallets, the works of the clock acting upon the minute and hour hands. By causing the circuit to be complete by the passage of the current through the similar coils of other instruments at distant stations, connected by appropriate wires, a series of such clocks might be made to work together with absolute accuracy.

In July, 1841, Mr. Bain exhibited at the Polytechnic Institution in London an electric printing telegraph, and in the following year he proceeded to patent an improved form of the apparatus. The essential principles of this contrivance are two. First, the employment of type, mounted on the periphery of a disc or wheel, capable of revolving with its edge carrying the type very near to a cylinder covered with white paper, between which and the type-wheel a piece of transferring paper or ribbon was placed. The cylinder had a small movement in a spiral direction communicated to it, after each impression of the type.

The action of this part of the apparatus will be readily understood, from the brief description of the printing telegraph of Professor Wheatstone, already given. It is only necessary to particularise, that in Mr. Bain's machine the type were arranged on the edge of the disc or wheel, radiating from its centre; and that the printing of any one upon the cylinder was affected by the movement forward of the entire type-wheel and its axis, by a crank and connecting gear in the printing train. The end of the paper, having been struck down by the printing-hammer, is impressing a signal. The second principle is that of the use of two clocks at the same time, to perform the communication, one by transferring a uniform motion. These clocks, having been adjusted to exactly the same rate, and being started from the same signal, would bring continually, at each station, similar type opposite to the paper cylinders at the same moment. The
in action of this portion of the apparatus is exactly analogous to that of Mr. Ronalds, already described. A hand or index revolving on a dial in front of the machine, at the same rate as the type-wheel, indicates to the operator the signals which are to be printed out for printing in copper the own instrument, and therefore, if the clocks go exactly together, in a similar position in his correspondent's instrument from this hand of returning in contact in its revolution with a pin, placed by the operator opposite to any signal that he wishes printed, completes the electric circuit at this moment, and by so doing stops the type-wheel, and thus enjoying true at each station. A similar signal, having thus been impressed on the cylinder at the two ends of the line, the operator removes the pin, and replaces it opposite the next signal he requires to send. The moment the pin is removed, and the circuit therefore broken, the hands and type-wheels at each station resume their revolutions, which are again checked by the contact of the hand and pin as before.

Mr. Bain's single-index telegraph, which was the instrument proposed by him for practical use, consisted of two hollow cylindrical coils of wire, placed horizontally a short distance apart, with their axes in the same line. Between them a small bar magnet was fixed across a delicate spring, which in free passage through the dial-plate of the instrument, and was turned up to form an index. The two coils were connected, so that an electric current entering from the line wire would pass through both of these, and as the bar magnet would be acted on towards one coil, while at the same time it would be repelled by the other. These actions tended to carry the magnet around the axis, as far as the spring to which it was attached and a fixed stop would allow it to move as a wheel. The reversal of the current inverted the effect of the coils, and the magnet would then pass to the other side. The combinations of these two movements represented the two separate letters and signals, being denoted to the observer by the index on the dial of the instrument. The movement of the index to the left denoting the letter I, and to the right the letter V, this instrument obtained the name of 'I and V Telegraph.'

In the autumn of the following year (1842) Mr. Bain patented his proposed plan for working an electric telegraph 'without any galvanic battery whatsoever,' or, more correctly speaking, with a peculiar form of battery. At one end of the line he buried in moist earth a large plate of zinc, and at the other end a plate of copper, iron, or other substance such as coke or charcoal, which might set the part of a negative plate to the zinc. Then on connecting these distant plates with a wire insulated from the earth, a current of electricity would constantly pass from one plate to the other. Indeed the very idea that such a current should be connected with the earth, as above described, may be regarded merely as a battery of one pair of plates, separated by a very wide interval of exciting material, resting on earth. It was at first supposed by Mr. Bain that this current would be sufficient for its conveying purposes, but subsequent experiments showed that it was available only for a few miles of distance; its intensity being insufficient to travel through any great length of wire. In some cases, where a large current of a uniform intensity is required, this earth battery would become very useful and important.

In the early part of the year 1843, Mr. Cooke specified his patent for what has been probably the most important part of the invention, regarded in a commercial point of view. This was in reference to the mode of extending the wires between distant places, so that their insulation from one another and from the earth, might be maintained without the heavy expense and unavoidable difficulty hitherto incurred. Before this period, the wires having been covered with cotton and insulated by coating them with shell-lac, resin, or pitch, had been laid down in tubes or pipes of wood or iron. This method had been adopted on the Blackwall line, in 1840, and has not since been altered. On the Great Western Railway it was superseded by the new and improved mode of insulation. Mr. Cooke now proposed to insulate the wires by suspending them in the air upon posts or standards of wood or iron; the wires not being in actual contact with any part of the earth or other conductor, the bar magnets being removed from the earthware. The standard were usually fixed at from forty to sixty yards, and at each quarter of a mile a stouter post was set to, to bear the winding or straining apparatus.

This was a simple winding-post, connected with a quadrant-wheel and click to prevent its recoil, after the wire had been strained up by its means. The intermediate posts within each quarter of a mile were simply supported on the ground without reference to its tension, which depended solely on the weight of wire. Instead of the copper wires hitherto employed, iron wires of a larger size were now used: By the adoption of this method of extending the wires, the expense of erecting a telegraph was reduced nearly one-half, and at the same time the risk of imperfect insulation was diminished. So long as the wires were buried in tubes beneath the ground, it was no better than if they had been stretched from one end of the line to the other; if it was found very difficult to render the insulation sufficiently good to enable the earth itself to be used as half of the circuit. The conductivity of the electric fluid to escape from the wires in the tubes, to the earth, was much greater than to another wire lying in the same position, so that the latter plan was always adopted. But when the suspenders conductors came into operation, the insulation was rendered so complete, that the earth was subsequently in all cases used to return the current, by which means an economy of one wire throughout the whole line was effected.

In addition to this, another very decided advantage was gained by the suspension of the wires, in the facility of which accidental errors or injuries were discovered and rectified. While the tubes were in use, it was necessary to supply at about each quarter of a mile along the line, a proving or testing post, where the instrument was connected to the main line to afford the means of examining any of them as to their insulation and conducting power. For this purpose Mr. Cooke had invented an instrument called the Detector, by which the presence or absence of any error or fault discovered with considerable accuracy. Bell with all these appliances, the detection and repair of any derangement of the wires demanded considerable skill, and led to no small expense. But when the wires were in sight throughout, any contact or fracture was at once visible, and was easily and quickly repaired.

Having traced the invention through a few of its most remarkable stages, up to the time when it assumed the form it presented in England, we may add a few words on the method of applying it to the purposes of a railway. Mr. Cooke's first plan was one of admirable completeness in all its details. We can do little more than indicate its outline, as the full description would occupy far too much space. He proposed to divide the entire line of a railway, if necessary, into portions including each from four to six stations, and to make the traffic and communications within each of these divisions wholly independent of those on any other portion. The stations at which these partitions were to be termed Division Stations, and might be relatively, as above delineated, as above described, or any other form, the termini of each division, and the actual termini of the line, so as to bind the whole of the sub-divisions together in the most perfect manner, and yet maintain a considerable correspondence between the most distant points. Each station possessed a wire of its own, extending from one to the other termini of its division, and including at every station a pole or pillar, with a coil and a broad wire current of a uniform intensity, as before described, signals by any wire and system of needles, was provided at each point, so that the most ample means of correspondence was secured between all the stations. Each needle was used to denote the condition of that part of the line which was under the control of its own station; and by its means the movements of all trains upon this portion of the railway were made known to all the stations in the same division. As the signals made by any needle were simultaneously visible by the corresponding needle at all the stations, and as all information respecting the arrival or departure of trains, state of the line, accidental impediments, &c., was immediately indicated by known signals upon the telegraph, the station master at any point had only to turn to his instrument, to perceive at a glance the existence of any circumstance which might influence the working of the line at any station. Nothing was left to
be issued or inferred, was evident and visible, and in fact, in the words of Mr. Cooke, the clerk at each station possessed in his telegraph a constant bird's-eye-view of the whole of his division.

In addition to these 'line' wires, as they may be termed, there were in every case facilities extended throughout the line, with instruments at each station, so as to afford the means of verbal communication, whenever this might be necessary. The result of such a complete system could hardly fail to be most beneficial, and experience has now proved how accurately and justly all Mr. Cooke's measures were planned beforehand.

The Blackwall line absolutely depends upon this instantaneous means of communication, not only for its safety, but for the very possibility of its being worked. On this railway however the telegraphic system is different, insomuch as from its peculiar locomotive plan, the stations do not require any communication between themselves, but only with the two terminal.

Even on railways possessing a double line of rails, so complete a arrangement as that described in reference to the Vernon and Norwich line, would tend much to the prevention of accidents and increased safety of travelling. To prove this it is hardly necessary to recall to mind the disasters which have occurred, and still do occur at times, from the want of intelligence as to the unexpected approach of a train, or its undue delay on a particular part of the journey. Where there does not exist however an absolute necessity for such a system, its unnecessary expense would be likely to deter its adoption. In order therefore to meet the requirements of the railway as economical a mode as possible, a modified system has been adopted. The same plan of divisions and of communication is still adhered to, but these lines-needles are dispensed with, and merely the ordinary telegram retained at the subordinate stations. Usually the instrument possessing two needles and requiring two wires, is preferred for both the general and the divisional telegraph, as experience has shown that it is, taking all things into account, far superior to any other. The single-needle instrument, with one wire, is sometimes used for the small stations; but where due to frequent occurrence of a considerable length, it has been found that it cannot be used with advantage, from the diminished rapidity of signalling, as compared with the double needle.

It is evident that in the system above described no subordinate station can communicate directly with another station beyond its own division. Intelligence therefore referring to a distinct portion of the line, would be sent in the first place to one or other of the terminal stations of the division, and from thence would be forwarded again as required.

In England, up to the present time, the electro-magnetic or 'electric' system (introduced on one or more occasions the needle-telegraphy, of Professor Wheatstone, has not been adopted; the needle-instrument, from the great rapidity with which messages can be sent, and from other causes, having obtained very generally the preference. It is now however rendered capable with particular systems of working a line of railway, and in some cases for the transmission of political or commercial intelligence, where accuracy is required. It is now in use in England, and has been entirely approved of. Within this last year or two a great and important improvement has been effected in the mechanical instrument, by the use of the electric current derived by induction from a permanent magnet, instead of the voltaic battery. This plan is not applicable to the needle instrument, but is peculiarly so to the electro-magnetic telegraphy; while at the same time a permanent and unalterable source of electric power is substituted for the galvanic battery. Although this system is now employed for telegraphic purposes is sufficiently constant in their action, yet this is a most important advantage, obviating as it does all necessity for change or renewal of the source of electrical power.

Referring to our readers incidentally to the extent to which the electric telegraph has been adopted in England, at the present time. We therefore subjoin the following statement of the lines of telegraph in actual operation:

| South-Western | 99 |
| South-Eastern | 88 |
| Romney branch | 30 |
| Maidstone | 10 |
| Tunbridge Wells, &c. | 12 |
| Blackwall | 5 |
| Eastern Counties: Colchester line | 81 |
| Thames junction | 3 |
| Cambridge line | 88 |
| Herford branch | 7 |
| Ely and Peterboro' | 26 |
| Norfolk Railway | 38 |
| Yarmouth and Norwich | 20 |
| Lowestoft branch | 10 |
| Wolverton and Peterboro' | 57 |
| Eastern Union | 17 |
| Midland Counties: South line | 49 |
| West line | 41 |
| North line | 78 |
| Derby and Lincoln | 41 |
| Sheffield branch | 5 |
| York and North Midland | 23 |
| Hull and Selby and Milford Extension | 40 |
| York and Scarborough | 48 |
| Great North of England: York and Darlington | 45 |
| Richmond branch | 9 |
| Newcastle and Darlington | 39 |
| Durham branch | 2 |
| Sunderland | 6 |
| Shields | 3 |
| Preston and Wyre | 20 |
| Great Western | 19 |
| South Devon | 29 |

Total 1041

This list does not include several lines on which the telegraph is yet only in partial operation or now being erected. Among such may be specified the Leeds and Bradford, Leeds and Manchester, St. John and Peterboro', Newcastle and Berwick, North British, Hull and Bridlington, &c.

TELEGRAPHIC. TEMPLE. TEMPEL. TEMPLE. TEMPLE. TEMPEL. TEMPEL

TEMPLE. TEMPLE. TEMPLE. TEMPLE. TEMPEL. TEMPEL

This paper is somewhat of the subject of the Wellington exhibition, and it is therefore natural that the English telegraph should command our attention. The disastrous effect of accidents arising from trains meeting or overtaking each other, although it is a subject of great importance, is not, however, an exclusive property of electric telegraph lines; accidents constantly arise from the same cause, and it is necessary to adopt some system of telegraphic communication to check their occurrence.

The system now adopted in England is a simple one, and is based on the principle of the electric telegraph. Each station is provided with an electric battery, which is connected to the next station by a wire, and is thus able to send and receive messages instantaneously. The battery is capable of sustaining an electric current for a considerable length of time, and is therefore able to transmit messages over a considerable distance without the necessity of frequent renewal. The messages are transmitted in the form of dots and dashes, which are produced by a key, and are received by a similar key at the other end. The dots and dashes are transmitted at a rate of four words per minute, and are read by a telegraphist who is stationed at each station.

The system is simple and easy to understand, and is capable of being operated by a small number of persons. It is also cheap, and requires little maintenance. The cost of the apparatus is about £50 per mile, and the cost of maintenance is about £2 per mile per annum. The telegraph is operated by the Government, and is used for the transmission of important messages, such as orders for the military and civil authorities, and for the communication between the different parts of the country.

The telegraph is also used for the transmission of news, and is therefore very useful for the purpose of communication between different parts of the country. The telegraph is a great convenience, and is becoming more and more extensively used. It is a great improvement on the old system of communication by horse and mail, and is therefore to be highly commended.
Vendore and Purchaser, P. C. With respect to the provisions of this Act all must admit that they are beneficial. The principle that by a sublety a subsequent purchaser might obtain a priority over the bond file, purchaser was unjust and would only have been resorted to by judges if the legislature had not left the laws of property in an incomplete state. This devise of assignments of outstanding legal interests was but a clumsy and imperfect substitute for a general act with this addition, that it protected one innocent purchaser at the expense of another. There are, in opinion of many, some technical objections to the statute, which we cannot here enter into; but its evil will be removed. TERRITORIES OF INDIA. The information which was promised, in the article BENGAL, P. C., p. 232, to be given under the head BARTISH INDIA, is given under that of EAST INDIA COMPANY, P. C. The area of Hindustan, from the Brahmaputra to the Indus and from the Himalaya Mountains to Cape Comorin, has been estimated at about 1,200,000 square miles, and the population at about 120,000,000. The British possessions from the Ganges eastward to the frontiers of Birma will be included, the entire area may be estimated at 1,270,000 square miles, and the entire population at 140,000,000.

The following tables are given, in the deficiency of official returns, merely as approximations, in order to afford such a general view as may be useful, though not accurate, of the areas, population, and possessors of the territories of Hindustan:—

<table>
<thead>
<tr>
<th>British Possessions</th>
<th>Square Miles</th>
<th>Inhabitants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bengal Presidency</td>
<td>320,000</td>
<td>47,000,000</td>
</tr>
<tr>
<td>North-west Provinces</td>
<td>100,000</td>
<td>20,000,000</td>
</tr>
<tr>
<td>Madras Presidency</td>
<td>140,000</td>
<td>15,000,000</td>
</tr>
<tr>
<td>Bombay Presidency</td>
<td>70,000</td>
<td>8,500,000</td>
</tr>
<tr>
<td>Sinde</td>
<td>70,000</td>
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<table>
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<tr>
<th>Dependent States</th>
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<tr>
<td>Hydabad (The Nizam)</td>
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<td>Berar, or Nagpur (Raja)</td>
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<td>Diopolon, Tonk, &amp; c.</td>
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<td>Independent States</td>
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1,270,000 140,000,000
The Bengal Presidency comprises the provinces of Bengal, Bahar, Benares, Allahabad, Orama, Cuttack, Gudwana, the Ceded Districts on the Nerbudda, and the British territory east of the Ganges to the frontiers of British India. The North-West Provinces comprise the territory of the late Agra Presidency, which was established by an Act, 3 & 4 Wm. IV. c. 85 (August, 1823), but suspended by a subsequent Act, 6 & 7 Wm. IV. c. 154 (August, 1828), which empowered the Governor-General to appoint a lieutenant-governor of the North-West Provinces, and also from time to time to declare and limit the extent of the territory placed under his administration, and which was limited by the Act of 1828 before his death a powerful army and large stores of arms and ammunition. He was succeeded by his son, who having since died, and the present Maharaja, Dhuleep Singh, who succeeded him and is living very young, is being very unjustly kept in confinement by his father's courtiers. The Madras Presidency comprises the Northern Circars, the whole of the Carnatic, and extends westward across the peninsula as far as the province of the Madura (Madalar, Canara, &c.) south and west of Mysoore.

The Bombay Presidency comprises all the British territory on the west side of Hindostan from Canara northward, the Coromandel South Maharta country, Goacon, Candia, Coromandel, Surat, &c. The Bombay Presidency will probably be made to include Sind, which was annexed to the British territory in March, 1843, and is yet (1845) under a separate governor. The province of Bahar, under Sir J.T. Basset, was added to the British territory a portion of the Lahore territory on the east banks of the Ganges and Sutlej, and the Jullundur Doab, between the Beas and the Sutlej, with a considerable portion of hill-country which extends north-east towards the upper Provinces of India. By the treaty of peace with the Maharajah of Lahore, the British assume the control, in respect to tolls and ferries, of the Beas and Sutlej, the Ganges, and the Jallunder, and the control of the Indus from Mithakote to the borders of Beloochistan.

Each Presidency is divided into Collectorates for purposes of revenue and administration, but accounts are not published of the extent and amount of the Collectories separately. A general statement of revenue is published for each Presidency. The last actual statement (not an estimate) is for the year 1843-4, as follows:

- Bengal Presidency: £7,928,500
- North-West Presidency: £4,195,438
- Madras Presidency: £3,601,966
- Bengal Presidency: £2,046,728

Total receipts from assets in England and China: £1,131

Total Income: £17,173,788

Total charges in India: £15,668,843
Total charges in England and China: £2,944,073

Deficiency: £1,842,918

The total amount of the public debts of the Presidencies, on the 30th of April, 1844, was £3,539,830, bearing annual interest amounting to £1,761,622.

British India, strictly speaking, comprises only the territory which is actually in the possession of the British government, but the whole of Hindustan from the Indus to the frontiers of Birma, where the exception of Nepal and Bootan, is under British suzerainty and control, and in fact forms one great body politic, of which the British government is the head. The late Nawab of Gherat, Sir Haydn, was, in the opinion of some, feodatory, and some are restricted, according to the circumstances and treaties under which they became dependent. The new Cashmer state is feodatory. Glodiah Sing is the new Nawab of Lahore, government annually one horse, twelve perfect shawl-goats (six male and six female), and three pairs of Cashmere shawls, as an acknowledgment of the supremacy of the British government. The government of Lahore is limited by the new treaty to 25 battalions of infantry, consisting of 800 bounties each, and 12,000 cavalry. If a larger army should be necessary in any emergency, it may be increased by detachments from the army of the British government under the limits of the Lahore territory are not to be changed without a serious concurrence. All the dependent states are prohibited from making treaties of alliance with each other. The Portuguese still possess Goa, with a small territory around it, and the port of Damman; the French, Pondicherry, Madag, and Corisville. Scarampore and Tranquebar have been recently purchased by the British government from the Danes.

The circumstances of the annexation of Sind to the British territory are stated in the article Sind, F.C.S.

The late ruler of the Panjab, Ranjeet Singh, always remained on terms of amity with the British government in India, and the late Maharajah, Dhuleep Singh, who succeeded him and is living very young, is being very unjustly kept in confinement by his father's courtiers. The Sikhs army however mutinied and unprovoked, and the result was that the Lahore government, in order to extract themselves from the dangers to which they were constantly exposed, the city of Delhi, and having very recently secreted its garrison to the leaders of the Sikhs troops in making an attack on the British frontier. The Sikhs army began to cross the Sutlej, Dec. 11, 1845, and, after investing Ferozepore on one side, took up an intrenched position at the village of Ferozeshah, about ten miles in advance of Ferozepore, and about the same distance from the village of Moodkee. In this camp the Sikhs had placed 105 pieces of cannon, and a force of upwards of 50,000 men, in order to intercept the British force which was advancing from Umballah to the relief of Ferozepore, which had been attacked without provocation or declaration of hostilities. The British Army, under Sir Hugh Gough, commanders-in-chief, entered the rapid march of 150 miles, reached Moodkee, Dec. 18, and on the evening of the same day required an attack of the Sikhs army and captured 17 guns. On the following day the army was continued, a small body moved towards Ferozepore; and having on the march formed a junction with Major-General Sir John Liddler, who had with him 5000 men and 21 guns, Sir Hugh Gough formed the army in order to attack the main Sikhs' intrenched camp, and on the evening of Dec. 22 captured 74 pieces of cannon, took possession of the camp, with large quantities of ammunition and warlike stores, and compelled the enemy to retreat to the west side of the Sutlej. The British force on this occasion consisted of 16,700 men, and 66 guns, chiefly horse artillery.

The Sikhs forces were variously estimated at from 40,000 to 60,000 men, with 108 pieces of cannon of large calibres and in fixed batteries. Sir Henry Hardinge, governor-general of India, was engaged in this battle as second in command. The total killed of the British was 604, the total wounded 172; in all 2415. The British took 91 pieces of cannon. The loss of the Sikhs must have been very large.

Major-General Sir Harry Smith having with much difficulty and loss of some men brought a junction with the troops at Loodiana, who, hemmed in by a formidable body of the enemy's troops, the Sikhs army then retreated, and took up an intrenched position at Budawl, from which they were also compelled to retreat down the Sutlej by Sir Hugh Gough, having been reinforced by about 40,000 regular troops, 12 pieces of artillery, and a large force of cavalry, from the right bank, they advanced towards the British forces in order to intercept their communication with the main army, intrenching themselves near the village of Allival. The Sikh camp was carried by storm on the 28th of January, 1846, the whole of the enemy's cannon and munitions of war captured, and his army driven headlong across the Sutlej by a difficult ford. Fifty-six guns were taken by the British, and 11 others were sunk in the river. The total of British killed was 151, the total wounded 413, total missing 25; in all 589. The commander at the battle of Allival was Sir Harry Smith.

The result of this second victory was the evacuation by the Sikhs garrisons of all the forts previously occupied by detachments of Lahore soldiers on the left bank of the Sutlej, and the submission of the whole of the territory on that side of the river to the British government.

Meantime the main body of the Sikh army had taken a position on the left bank of the Sutlej near Sobran, and formed a strong bridge of boats, and a strong battery on the left bank, which Sir Hugh Gough did not deem prudent to attack till the Siege of Sobraon was continued by Sir John Liddell, which continued to the end of the year 1845. In the beginning of 1846, having arrived on the right bank of the Sutlej, the British army was intrenched on the same day, which had been reinforced by Sir Harry Smith with the victorious army of Allival, the attack on the Sikhs made on the 10th of February. The enemy's camp, strongly intrenched, defended by 35,000 men, and 67
pieces of artillery of large calibre, with a considerable camp and some artillery on the opposite bank of the river, was strengthened by a battery under Sir Hugh Gough, and after two hours of desperate resistance on the part of the Sikhs, they were driven into and across the river with immense loss, 67 guns having been captured by the British. Sir Hugh Gough, according to the effects of the fall, was also in this battle. The loss of the enemy is sup-
prompted to have been from 8000 to 10,000 men. The loss of the British was 230 killed, 2035 wounded; in all 2355.

The fall of the Sikhs and their retreat from the west bank of the river, having been defeated in every action, with the loss of a vast number of men and 320 pieces of field artillery. The British army crossed the Satleuj, engaged the Gurmukh and the Maharaaj Bhuleep Sing, his heirs and successors, on the other, was concluded at Lahore, March 9, 1845. A similar treaty was concluded with the Maharaja Gholab Sing at Umbrit, or Amrit, March 16, 1845.

Sir Henry Hardinge has since been created Viscount Hardinge, with an annuity of 3000L, and Sir Hugh Gough has been created Lord Gough, with an annuity of 3000L, to the two surviving heirs male of the body of each by whom the other two receive the respective titles; but the Court of Directors of the East India Company having granted to Sir Henry Hardinge an annuity of 3000L, and to Lord Gough an annuity of 4000L, particular of the official provisions of the East India Company, etc. it was enacted that the government annuity of 3000L should not be paid to Viscount Hardinge till after the annuity of 3000L granted to Lord Gough, and an annuity in like manner was granted by the East India Company to Sir Hugh Gough, it was enacted that only one-half of the govern-
ment annuity should be paid to Lord Gough till after the East India Company's annuity terminates. The two annuities granted by the East India Company commence from the date when the British troops arrived at Lahore. Viscount Hardinge has therefore 4000L a-year, and Lord Gough 3000L a-year. Their two next surviving heirs male of the body of each will have respectively the government annuities of 3000L and 2000L.

(Tamils, P. C.)

TERTIUSIANUS, Jurist. [Tasteullianus, P. C.]

TERRA ESTEN, AUGUSTYN, was born at the Hague in 1649. He became at about twenty years of age the pupil of N. Wieling and W. Doudens; before this time he had maintained himself by working and chasing for goldsmiths. In 1673 he went to Italy, where he studied chiefly in Venice and Rome, and visited France and England; and after an absence of six years returned in 1678 to the Hague, where he continued to be employed by his historical and mythological compositions, sacred and profane, but his favourite author was Ovid. He restored the Academy of the Hague, which had declined to a very inefficient state; and in 1696 he was invited by Emperor Leopold I. to the courts of Prussia, Prussia, and Berlin, and was appointed his court painter. He contributed chiefly to the establishment of the Academy of Berlin, of which he was made director. He died at Berlin in 1711. He presented with remarkable rapidity and freedom; there are a few etchings by him.

(Hoobraken, Grosse Schouwburg der Konst Schluders, etc.)

TESSELATED PAVEMENTS. [Tiles and Pav-
ements. P. C. S.]

TEST ACT. [Boroughs, &c., P. C., p. 209.]

TESTE DE A WRIT. [Writ, P. C.]

TESTELEIN or TETTELEIN, LOUIE, was born at Paris in 1616, and was a pupil of Voset. He was elected one of the original members of the French Academy, though he was only thirty-three years of age at its establishment in 1635. His presentation picture was an historical portrait of Louis XIV. In 1650 he was appointed one of the professors of the academy. Testelin's picture of the Resurrection of Tabitha by St. Paul, painted in 1652, is considered one of the masterpieces of the French school of painting, and is com-
pared with Le Sueur's celebrated picture of Paul Preaching, and the Burning of the Books at Ephesus; it is in the church of Notre Dame; there is a print of it by Rocque and Picard de Rancourt, and the Maharaaj Bhuleep Sing in the church of Notre Dame— the Flagellation of St. Paul and Silas, which was painted in 1655, the year of his death.

St. Louis attending a sick man, in the Hospital de la Charité, is likewise a distinguished work by Testelin. As he died at the early age of forty, his works are necessarily scarce. A few among the whole night through, Le Brun rose, saying, 'My friend, you have charmed me by your profound knowledge; the victory is yours; certainly no man is better instructed in the great mystery of this art.'

(D'Argenville, Abrégé de la Vie des Peintres, &c.)

TETRAGONOLEPIS, a remarkable and numerous genus of fossil ganoid fishes, chiefly from the limestone strata of Dorset-
shire. [See Argentine, &c.]

TETRAN' Theria, a genus of plants belonging to the natural order Laureceae. The flowers are discoid, some hermaphrodite, inovulculated. The calyx 6-parted, the seg-
ments nearly equal or wanting. The fertile stamens generally about 9, in the petalsoid flower from 12 to 21. The leaves are variable, with pinnate veins.

T. K., a large spring in the valley, a native of the mountains of India and China. The leaves are ovate, oblong, acute at the base, smooth and shining above, more or less downy beneath. The umbels rather compound and nearly white. The fruit is a case, yellow or brown, containing a pea, yielding a kind of greasy exudation from which the Chinese prepare preservative candles of a bad quality, and which serves as a basis for salves. This fixed oil is supposed to constitute the principal part of the fruit of Persicaria protistina, so much esteemed in the West Indies under the name of Avocado Pear.

(Lindley, Vegetable Kingdom; Lindley, Flora Medica.)

TETRAPODON, [Gymnobranchia, P. C. S.]

TETRAPHERUS, a genus of fossil fishes from the Cre-
aceous and Tertiary strata. [Agracn.]

TEXAS. This country lately formed a portion of the territory of Mexico. The revolution through which it became separated, arose from the permission given to immi-
grants from the United States to receive grants of lands. The first permission of this kind was conceded to Moses Austin in January, 1821, which on his death was extended to his son, Stephen Austin, and confirmed by the Mexican Cortes, April 14, 1823. These and other similar concessions were made on condition of bringing into the country from 500 to 200 families as the consideration of each grant of land.

Texas formed part of the State of Coahuila in the confed-
eration of the Mexican States. It was established as a state August 15, 1824, and the State Constitution was pro-
mulgated in March, 1827.

In 1829 there was a convention between the Mexican troops and the American settlers occurred. This was followed by various conflicts and at last the independence of the country was proposed, when Stephen Austin adviced that no limits of territory should be fixed, and the means of defense to Texas should be left open to extend beyond the Rio Grande to Chihuahua and New Mexico.

On the 21st of April, 1836, the battle of San Jacinto was fought between the Mexican and Texan forces, when the president of Mexico, General Santa Anna, was taken pris-
ero by General Houston. This event terminated all Mexican authority in the country.

In 1837 the Committee of the United States was formed to attend the House, that the independence of Texas ought to be recognized, and was continued upon the table—but at the last hour of that session of Congress, by the President of the United States, an amendment to the General Appropriation Bill was carried, for the payment of the outlay of government of Texas. This amendment which the President should receive satisfactory evidence that Texas was a independent power. Immediately after this bill was
signed by the President, the nomination of a Chargé d'Affaires of Texas was sent by him to the Senate and consented to by it—and thus it was, that the Republic of Texas was recognised by the United States. To have effected this recognition by treaty, a majority of two-thirds, inclusive, and such a majority could not then have been obtained. A mere majority was sufficient to confirm the nomination of a Chargé d'Affaires.

On September 25, 1839, a treaty was signed between France and Texas, and was ratified at Austin, Jan. 18, 1840. This was the first recognition of the independence of Texas by a European power. On Nov. 16, 1840, a treaty between Great Britain and Texas was signed, and was ratified at Austin in Feb. 1841. But no treaty was made between the governments of the United States and Texas; and in consequence of no such treaty being required as a condition precedent to the recognition of Texas independent by this country, the annexation of Texas to the United States was greatly facilitated.

The government of Mexico persisting in its refusal to acknowledge the independence of the country, proposals were made to annex the Republic to the United States. The trade and security of the people settled in the western district were constantly disturbed—marauding incursions were common, and the government had not pecuniary resources sufficient to enable it effectively to carry on a war. It had been hoped that the influence of France or of Great Britain would have checked the evils arising from the obstinacy and weakness of the Mexican authorities. Nothing happened that did not happen, public opinion became favourable to a union with the United States, and this feeling was further stimulated by the efforts of Presidents Tyler and Polk, both of whom strongly urged upon the Congress of the United States the policy of taking advantage of the opportunities afforded by the political condition of Texas. On the passing of an Act by the Texas Congress to surrender its independence, in December, 1845, an Act of Congress of the United States declared Texas to be one of the States of the North American Union. The boundary between Texas and the United States was fixed by the Florida Treaty of 1819. The Congress of Texas declared the western limits of Texas to extend to the Rio Grande, including the department of New Mexico, which had never formed part of the State of Texas or Colombia, and was settled by the Spanish as early as 1690.

The government of the United States, since the annexation of Texas, appears to make a claim to the same extent of territory, and there is also every probability that one of the results of the pending war with Mexico will be to extend the authority of the United States over the entire province of California.

Address of J. Q. Adams to the Electors of Braintree, September 12, 1842; Kennedy's Texas; Congressional Documents of the Senate of the United States, 1846; Falconer on the Discovery of the Mississippi, 1844.

THAW is the reduction of ice or snow to a liquid state in consequence of an increase of temperature. This effect is produced on the surface of the earth or in the atmosphere during the spring season by the return of the sun to the hemisphere of the observer, the solar rays then falling in greater abundance than before on a given extent of ground; or it is produced by accidental currents of warm air which pass over a frozen mass. The dissolution of the particles of ice in the atmosphere is the cause of the humidity which accompanies a thaw.

As the conversion of a liquid into ice always commences at the surface of the former, and about the sides of the vessel containing it, or about those of a solid body immersed in it, so in ice surrounded by air which has acquired a higher temperature than the ice has, the process of liquefaction commences at the sides and extends gradually from thence inwards; ice being a bad conductor of heat, the central parts of it are the last which are dissolved. It is observed that when solid bodies, whose temperatures are equal to one another and higher than that of ice, are applied to the latter, the ice is dissolved most rapidly by those which have the greatest power of conducting charcoal; thus a piece of ice being laid on a plate of polished metal, and a piece of equal magnitude on wood, the ice on the metal will be dissolved before that which is laid on the wood, not only when the temperature of the metal and wood are equal, but even when the temperature of the wood considerably exceeds that of the metal, the latter conveying more abundantly to the ice the calorics which it is continually receiving from the charcoal.

A severe and long-continued frost abstracts so much calorics from terrestrial bodies, as the walls of buildings which are not exposed to the sun, that these are often cooled below the temperature of freezing water; and while in this state, if a current of warm air pass over their surfaces, the water which the air holds in solution deposits itself on the walls, where it is converted into ice or snow; it remains thus frozen for a time after a thaw has commenced, but at length, the temperature increasing, the ice is melted and the walls are then covered with moisture.

It is often remarked that at the time of a thaw taking place there is felt a degree of coldness greater than that which is experienced during the continuance of the frost; this is apparently caused merely by the evaporation of the moisture which is then on the skin, for the thermometer at the same time indicates an elevation of temperature in the atmosphere.

The overflowing of rivers by the dissolution of the snow and ice on the mountains about their sources is well known, and to the liquefaction of the ice formed by the previous congelation of water which has introduced itself in the fissures of rocks is to be ascribed the occasional servitude of large masses from the sides of mountains; the expansion of the water in freezing having destroyed the cohesion, so that the parts are only held together by the ice, and on the liquefaction of this the disunion is complete.

Thebes. The writer of the article THEBES, P. C., has, owing to a misapprehension, given references to Carnac and Luxor, instead of describing them under the article Thebes.

We now supply the omission.

On the site and amongst the ruins of the ancient city of Thebes stand four principal villages, Carnac and Luxor on the eastern bank of the Nile, Gournou and Medinet-Abou on the western bank. At Luxor, near the river, are the remains of a temple, the entrance to which is through a magnificent propyleon, or gateway, consisting of two pyramidal piles, the lower part of which is now concealed by accumulated sand, but which probably form a propylon as large as that of Carnac hereafter described. In front of the propylon, which is covered with elaborate sculptures, stood two of the most perfect obelisks known to exist, one about 82 feet high, the other 76, and from eight to ten feet wide at the base. The

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smaller obelisk has been removed by the French, and now stands in the Place de la Concorde at Paris. A ship constructed expressly for the purpose of transporting the obelisk sailed from Constantinople to Alexandria in 1831. The obelisk was selected as not only lighter, but in a better state of preservation than the larger. This obelisk was found to be placed on a higher pedestal than the other, and somewhat modified in form to make the difference of size less apparent to the spectator. The obelisk was lowered, conveyed to Paris, and erected Oct. 25, 1836. The cut on the preceding page presents a view of the two obelisks with the propylaeum and them, and a portion of the ruins of the interior of the temple.

But the remains of Carnac, about a mile and a quarter lower down the river, are still more wonderful than those of Luxor. An irregular avenue of sphinxes, 380 yards in length, connects the southern entrance of Carnac with the northern entrance of the temple of Luxor. Carnac is about 830 yards from the east bank of the Nile, and is surrounded by a wall of unfinished bricks about 800 yards in circuit, or more than three miles. An adequate idea of the extent of the remains in this inclosure could only be given by a plan on a large scale. The largest of them, some have thought to be a temple and some a palace; (it may have been both) is 159 feet in length, 360 feet in its greatest width, and 392 feet in its least width. The entrance to it (the western entrance) fronts the Nile, with which it is connected by an alley of carioles, formed of a lion and a head of a ram. This alley consists of a propylaeum, without sculpture, 360 feet long and 148 feet high, with a great doorway in the centre 64 feet high; passing through which a large colonnade, 44 feet high, with a range of pillars to the west, and a double row of lofty pillars down the middle, which terminate opposite two colossal statues in front of a second propylaeum. A flight of twenty-seven steps then leads to an entrance hall, which has been called the Great Hall or postyle Hall of Carnac. It is 388 feet by 170 feet, and comprises an area of 67,629 square feet. The roof, which is flat, and when perfect was formed of very large slabs of stone, is covered with a roof of brickwork. The roof is eleven feet in diameter and the smallest nearly nine feet. Four churches of the size of that of St. Martin's in the Fields, London, might stand side by side in this vast hall without occupying the whole space. The interior propylaeum, pillars, and walls are covered with sculptures. Four beautiful obelisks form the entrance from the hall to the apodyton, or sacred place, which consists of three apartments, all of granite, and the central room, or sanctuary, is adorned with sculptures, and painting and gilding. Beyond the apodyton are porticoes and galleries, which were probably continued to another propylaeum.

Four propylaeum form the entrance on the south side, at the end of the long avenue of sphinxes leading from Luxor; and there was probably a similar one on the north side.

As an architect he designed the Casa del Ayuntamiento or mansion-house, of Toledo, and the churches of La Caridad and of the convent of the bare-footed Franciscans at Illescas; and he built the earlier obelisks and the smaller obelisk at the principal altar-piece of their college. He also designed the churches of the paintings and sculptures of these churches. In 1590 he designed the church of the Augustinians at Madrid, called de Donna Maria de Aragon, and painted the principal altar-piece of their college. He then designed the principal church of the Jesuits in Madrid, which are among his last works. He died at Toledo in 1625, according to Palomino, seventy-seven years of age; and was buried with great pomp in the church of St. Bartholomew.

El Greco's pictures were still very numerous at the end of the last century; Cean Bermúdez enumerates a great many in Toledo, Illescas, Escalon, Bayona, in Segovia, La Guarda, Mostoles, Casarrubios, Siguenza, Medina Celli, Valencia, Leon, at the Escorial, and in Madrid. Many have since been removed. Mr. Ford, in his 'Handbook of Spain,' notices only three pictures by this painter—Christ bearing his Cross, and a Nativity, and an Adoration, in the Salón de la Sagrada at Toledo.

Richard Cumberland speaks in high terms of the pictures of El Greco, especially the Preparation for the Crucifixion and the Parting of Christ's Raiment in the cathedral of Toledo, already mentioned, and the entombment of Don Gonzalez Ruiz, Count Orgaz, in the church of Santo Tomé at Toledo, which he considers his masterpieces. The first he terms a grand composition so entirely in the style and manner of Titian it must have been the work of Titian himself. The latter was painted for a family of the name of Orgaz, by the Augustin convent of San Esteban at Toledo, and this picture was painted in honour of the foundation—the saints Augustine and Stephen are represented depositing the cost in his tomb, and the picture contains the portraits of many distinguished persons of the time.

His son, George Samuel Theotocopolis, was also a sculptor and architect of eminence. He was appointed sculptor and architect to the king and the cardinal of Haro; and died at Toledo in 1631. He was the architect of the ocaqav of the cathedral: it is an octagon decorated with precious marbles and a painted dome, and is used as the treasury-house of the Virgin, where her splendid dresses are kept, as well as many precious relics.

( Cean Bermúdez, Diccionario Historico, &c.; Cumberland, Anecdotes of Eminent Painters in Spain.)

THE ELOIDUS, a fossil sauk from the upper Silurian strata of Ludlow. (Murchison.)

THEONOA, a genus of fossil Zephyrida from the secondary and tertiary strata. (Lamarron.)

THIBAUT, ANTON JUSTUS FRIEDRICH, a celebrated German jurist, was born on the 4th of January, 1772, at Hameln in Hanover. In 1792 he went to Göttingen to study law; he continued his studies at Königsberg; and he finished them at Berlin, where he entered the bar, and became a judge. In this university he took the degree of D.C.L., and in 1796 was admitted as a junior teacher of the law. He soon rose to eminence, and at the age of twenty-seven was appointed ordinary professor of civil law. In 1802 he went in the same capacity to Jena, where he published his 'System des Pandekten-Recht,' the first systematical attempt of the kind that was written in the German language, the former works on that subject having been written in Latin. The merits of this excellent work were generally acknowledged, and Thibaut was chosen by the Emperor Alexander one of the members of the foreign commission for the establishment of legislation for Russia, and in 1805 he was invited to the university of Heidelberg, where he remained till his death. Though scarcely thirty, he was considered to be the first civilian in the German Empire. He had not yet attained his great reputation. Twice Thibaut was chosen proctor of the university of Heidelberg, and nine times he filled the office of dean of the faculty. He was also chosen deputy of the university in the Prussian diets, but as his new duties interfered with those of a teacher, he resigned the office. In 1816 he was made a privy councillor. His fame and his popularity among the students led to his receiving the degree of doctor in Ellwagen, and in 1820 at Leipzig, where the place of professor of jurisprudence of law was offered to him with a very large income, besides a prebend in the chapter of Merseburg: but nothing could induce him to leave Heidelberg. In 1830 he was knighted by the Grand-Duke of Baden.
his former pupil, who in 1834 appointed him judge for the grand-duchy, in the newly established tribunal of arbiters for the Grand Duchy of Baden, and then (1837) for the court of civil and superior to a him as a teacher and a practical jurist. The great object of Thibaut was to distinguish clearly between the obsolete portions of the Roman law, and those which were of real value. In this he was much more amiable; to many a poor student he proved a kind father; to many who had talent, a wise friend. His house was open to all his pupils, whether introduced to him by others or by themselves. And particular attention was paid to students besides their legal knowledge, showed proficiency in music, of which he was a profound judge. His little work on Purity of Music quoted below is a specimen of his refined taste in this art.

The principal work of Thibaut is his 'System des Pandekten-Rechts,' mentioned above, of which the eighth edition was published at Heidelberg in 1834, 2 vols. 8vo., and a ninth edition in five volumes, by Professor Buchholz, Jena, 1846. This work is in the hands of nine out of ten lawyers in Germany, but though of the highest value, it is rather a difficult book to beginners. The following are the other works of Thibaut according to the date of their publication: "De Marriage," 1825, 4to.; "De Novamento," 1832, 4to.; "De Hochzeitsvertrag," 1826, 8vo.; "On Possession and Prescription," Jena, 1802, 8vo.; a work which caused a great sensation, but was afterwards thrown into the shade by Savigny's work on Possession. 3. "Civilische Verwaltungsrecht," Heidelberg, 1814, 8vo.; 2nd edit., 1822. 4. "Ueber Recht," Heidelberg, 1825, 8vo.; 2nd edit., 1820. 5. "Ueber die Nothwendigkeit einer Allgemeinen bürgerlichen Rechte in Deutschland," Heidelberg, 1814, 8vo. (On the Necessity of a Common Code of Laws for Germany.) This work placed its author at the head of a great legislative movement, and a short explanation is necessary in order that the reader may understand it. Anticipating German laws and a large portion of the Roman law exist there together, the former referring principally to landed property, entitled estates and others called 'noble estates,' the latter to the manors, and the manorial courts. The manor, the succession to such estates, the legal consequences of marriage inasmuch as it effects complete commutation of property, personal and real, between husband and wife, further details relative to civil and insolvency; while on the whole, contracts, the common succession to personal property and to land, except entitled estates either noble or villain, testaments (in a great measure) and many other things are regulated by the Roman law. In some parts of Germany the German and Roman elements of the law are knitted together by modern legislation into a regular code, civil and criminal, as the Austrian code; the Prussian, which is in force in the greater portion of the kingdom of Prussia; the Bavarian criminal code; the work of Feuerbach, in Bavaria and Oldenburg. But the civil law in the latter two countries and nearly the whole of Germany, except Austria and Prussia, is that compound of Roman and German elements which has been mentioned above. Besides the 'Common Law,' by which is meant the Roman-German compound aforesaid, there is a variety of provincial and local laws, among which the laws of the cities of Magdeburg, Hamburg, and Lübeck deserve a particular attention, especially the law of Lübeck, since it is not only shaped into the form of a code, but is the common law of nearly all the towns of Northern Germany as well as those in the adjacent provinces of Austria and Prussia, of Denmark, of Sweden, of Russia, of Poland, of Lithuania, and of Estonia. To augment the difficulties, the French code became the common law in the Rhineland provinces and in the grand-duchy of Baden.

The purpose of the present paper is to show that the administration of the law in Germany is no easy matter; and that the difficulties increase in proportion to the extent of the jurisdiction of the different courts; and hence the strange, yet under such circumstances necessary fact, that the faculties of law in the various universities were, and are still, of such a nature; and that the state is one which used-to be brought which require more learning, especially historical learning, than is generally possessed by the members of the common courts of justice. Thibaut's proposal was for a common legislation; that the idea itself was good, but that there were so many scientific (rather theoretical) differences among the jurists dividing the most important points, that every attempt would prove abortive till matters had previously been settled scientifically. Savigny also could refer to an example, the Prussian code ('Landrecht'), which, though only an experiment upon a portion of the laws, is yet considered to be a failure; he avoided to speak of the Austrian code. At present the opinion of Thibaut has more adherents than that of Savigny; and since the latter's views depend merely upon an eventuality which cannot but take place in the future, or at least it may be, it is to be presumed that the period when Germany will enjoy a common code is not so very distant. Thibaut has entered into many details concerning that important question in several of his numerous essays, dissertations, and treatises in all branches of law; one of the most interesting is his 'De Marriage.' He was the founder of the 'Civilistisches Archiv' and the 'Heidelberger Jahrbücher.'

(Thibaut, in Heidelberger Jahrbücher, year 1840.)

THIN PLATES. [COLOURS OF PLATES, P. C. S.] We take this opportunity of correcting an accidental mistake in the article referred to. It is there stated (p. 596, col. 2) that 'the thickness of the rings is the most and least luminous of the rings: whereas they are proportional to the squares of the semi-diameters of the rings.' Thalasp (a species of small, compressed, a genus of plants belonging to the natural order Cruciferae, and the sub-order Angiospermeae. It has a roundish notched boat-shaped, oval capsules with a longitudinal wing; the seeds are numerous, the petals equal, the flowers white. T. arvensis, Penny-cress, has oblong toothed leaves and erect stems, an elongated fruit-bearing raceme, orbicular capsules with a longitudinal wing. It is native throughout Europe and in England. The flowers are small and white, and the whole plant when bruised has a somewhat alliaceous odour. T. perfoliatus has obcordate pappus, the solitary leaves oblong, the petal equal in length to the calyx. It is a native of Europe and is found in England on chalky soil. T. alpaster is found on limestone mountains pastures throughout Europe and England; the leaves are entire, the radical leaves pinnate and entire, the inflorescences ovate, stellate; the style and stigmas 2; the petals nearly as long as the calyx, the pod obcordate, from 8- to 12-seeded. The species of this genus are hardly worthy cultivation except in general collections or in botanical gardens. They succeed best in a light sandy soil.

(From Gardener's Dictionary; Babington, Manual of British Botany.)

THOBALDSEN, BERTEL (Albert), was born November 19, 1770, at Copenhagen. He was the son of Gottschalk Thorvaldsen, a carver in wood, and his wife Karen Grünland, the daughter of a priest of Jutland. Gotta-

chak was a native of Iceland, and was in very poor circum-
stances when his son Bertel was born. Bertel assisted his father in his work at a very early age, and when only fourteen years old he attended the free school of the Academy of Arts at Copenhagen, and made such progress in two years that he was enabled to improve his father's carvings; and himself undertook to execute the head-pieces of ships. At the age of seventeen he obtained the silver medal of the academy, for a bas-relief of Christ and the woman of Samaria, and in twenty-two years of age, the small gold medal for a sketch of Heliodorus driven from the temple. Two years later he obtained the principal gold medal of the academy, and with the privilege of traveling for three years abroad at the government expense. Before setting out, however, he devoted a year or two to preliminary general study, for scholarship was not one of his acquirements, and he had much
to road and much to learn. On the 20th of May, 1796, he set out for Italy in the Danish frigate Thetis, and he arrived at Naples in the end of January of the following year, in the packet-boat from Palermo. The Thetis cruised in the North Sea in October, but he did not return to Denmark, which according to his own account he would have done if he had found a Danish vessel about to leave the port at the time. However, in a little time he found courage to engage a place in the coast of a vetturino for Rome, where he arrived March 8, 1797.

Thorwaldsen brought letters of introduction to his distinguished countryman Zoega, who however did not give the young sculptor much encouragement, nor did he estimate his ability very high. When Zoega was once asked what he thought of him, three years after his arrival, he answered with a shake of the head, 'There is much to find fault with, little to praise with, and he was upon his way at the time.' This time Zoega was right, except in the last particular. Thorwaldsen was industrious, but fastidious, and often destroyed what had cost him much labour. This was the fate of a MADELAINE with the Golden Hairs, which he had modelled to take back with him to Copenhagen at the expiration of his term of three years allowed by the Academy. He however made a second attempt at the same figure, and this statue was difficult to engrave. Lorenzo Zoegas praised Thorwaldsen was about to return to Denmark; and Canova exclaimed, 'This work of the young Dane is a new and a grand style.' By the assistance of a Danish lady, Frederika Brun, who gave him the necessary funds, he was able to have the statue in song, it was cast in plaster, and Thorwaldsen prepared for his return home; but when on the point of starting and about to step into the vehicle of the vetturino, one of his companions, a Danish sculptor Hansen, who was at the height of his skill, observed that his passport was not in order, and he was obliged to put off his journey until the next day. Thorwaldsen determined to wait with him, the vetturino started without them, this delay was followed by another, and it eventually happened that Thorwaldsen did not return to his native country until 1819, after an absence of twenty-three years. The liberality of Thomas Hope was the immediate cause of Thorwaldsen's finally settling in Rome. The works of Canova upon the statue of Jason were repeated in the artistic circles of Rome, and echoed by the professional eirenici of the place. One of these, a Count Marcolini, in 1803, came to the statue of the young Dane and saw the statue which the great sculptor had praised. The English connoisseur stood long before the plaster figure, then inquired what Thorwaldsen required for a marble copy, and was answered, 'You shall have 800,' was the generous reply of the Englishman.

From this time the star of Thorwaldsen was in the ascendant; the statue was however not finished until many years afterwards, but many celebrated works were done in the meanwhile; as the bas-reliefs of Summer and Autumn, and the dance of the Muses on Helicon; Cupid and Psyche; and Venus with the apple. His fame spread far and wide, and Christian, the present king (then crown-prince) of Denmark, wrote his pressing invitation to return to Copenhagen, communicating at the same time the discovery of a white marble quarry in Norway. Thorwaldsen was eager to return, but his commission rendered it impossible; he could not leave the papal city.

During this busy time Thorwaldsen recreated himself in the summer seasons at Leghorn, in the beautiful villa of Baron Schnitger, the Swedish minister at Florence: he executed also some of his works here.

In 1812, when arrangements were being made for Napoleon's visit to Rome, the architect Stern, who superintended the preparations upon the prescribed order, was one of the commissions of the Assembly of St. Luke, and asked him if he could get ready a plaster frieze for one of the large apartments of the Quirinal Palace, in three months. Thorwaldsen accepted the commission, made a model a month later, and had the frieze completed in three months, and a plaster sketch of his celebrated bas-relief of the Triumph of Alexander was completed. The immediate subject was Alexander's triumphal entry into Babylon: the length of the frieze is 160 Roman palms, its height five palms: it has been twice executed in marble, with slight variations, and is engraved in a series of plates by S. Amsler, of Munich, after drawings by Overbeck and others.

In 1819, in a single day, two of his most popular works, the bas-reliefs of Night and Day; but he had done nothing whatever for weeks and months before. In July, 1819, he started in the company of two friends on his first visit to his native land, and he arrived at Copenhagen on the 3rd of October of the same year: his parents had died some years before. His fame was now so well established, that even through Italy and Germany his journey was a special event of interest. His samples were shown to the King, who had them lodged in the palace of Charlottenburg and entertained with public feasts. In about a year he left Copenhagen and returned to Rome through Berlin, Dresden, and Warsaw, where he sent several commissions, and made a bust of the Emperor Alexander.

He executed his principal works after his return to Rome, as Christ and the Twelve Apostles; the group of St. John in the Wilderness; and the monument to Copernicus, Pius VII., Maximilian of Bavaria, the Poiniakowski monument, and others. In 1823 he had a narrow escape of his life: a boy, the son of his landlady, connived to get hold of one of his pistols, which he had left about the house, and the boy ignorant of the danger, pointed it and discharged it at Thorwaldsen, but the ball, after grazing two of his fingers, lodged in his dress without doing him any further injury.

In 1825, he received the commission to design a monument for the Pope, and the Apostles,—the principal works for the cathedral or church of Our Lady at Copenhagen,—and other works for the palace of Christiania, on which Thorwaldsen had been many years engaged, and which he had completed. He then received the frigate Rota to carry them and their sculptor to Copenhagen. Thorwaldsen was received with enthusiasm by his countrymen; and he remained among them on this occasion about three years, and never went to his friend the Baron Stampé, where a studio was built for him; and he finished here some of his last works—the frieze of the Procesion to Golgotha, for the cathedral; the Entrance into Jerusalem; and the death of the Virgin, which were finished, with the busts of the poets Oehlenschläger and Holberg. In 1841, finding the climate disagree with him, he felt compelled to return to Italy, and he executed at this time his group of the Graces for the King of Württemberg. He returned however to Denmark and Nyborg in the following year, and executed other works, bas-reliefs, which are among his last productions—Christmas Joy in Heaven; and the Genius of Poetry, which he presented to his friend Oehlenschläger. He intended to return to Rome in the summer of 1844, but he died suddenly in the theatre of Copenhagen, on March 31, in that year, aged seventy-three: he died of disease of the lungs, and was laid in state in the palace, and buried with extraordinary ceremony beneath his own greatest productions in the cathedral church of Copenhagen.

Thorwaldsen's portrait by 'Yngve' was sent to Sir F. Chantrey's; he bequeathed all works of art in his possession, including casts of his own works, to the city of Copenhagen, to form a distinct museum, which was to bear his name, on the condition that the city furnished an appropriate building for their reception. This building was nearly completed before the death of Thorwaldsen; 60,000 Danish dollars were subscribed already in 1842, and the museum fast approaches its completion. Besides the numerous works of Thorwaldsen, which would alone constitute an imposing collection of its class, it contains many works of ancient and modern sculpture, numerous paintings by old and recent masters, casts, engravings, etchings, engravings, cameos, medallions, curiosities, engravings, prints of all descriptions, books on fine arts, and drawings. With the exception of 12,000 dollars to each of his grandchildren, and the life-interest of 40,000 dollars to Madame Posthumus, his daughter, to descend to her children, the whole of his personal estate is to be converted into capital, and to be added to the 25,000 dollars already presented for the purpose by Thorwaldsen, to the sum of 65,000 dollars; and to make a fund from the interest of this sum for the purchase of the works of Danish artists, for the encouragement of Danish art, and to add to the collections of the museum. His daughter, now a widow, resides in Rome.
government is under five trustees, two always to be pro-
ferors of the Academy, one a magistrate of Copenhagen, and
one a citizen, chosen from the merchants, and one known
as the trustee, and all questions are to be decided by a majority
of voices. The trustees themselves will supply all vacancies as
they occur. There are at present six, but the perpetual num-
ber shall not exceed eight.

Thorwaldsen is considered by his admirers the greatest of
modern sculptors, and many have not hesitated to place him
far above Canova, and to compare him with the antique.
This is however hardly the rank he will hold with posterity;
his style is uniform to monotony, though many individual
figures are bold, solid, and of beautiful proportions. His
beau-idéal appears to have been something between the An-
icine and the Renaissance, but he has a characteristic
style; but as his subjects are seldom heroic, he seldom
required more than a moderate expression of heroic vigour or
robust strength and activity: in this respect, and in execution
generally, he was much surpassed by Canova; but still more
so in the grace of the female form, in which Thorwaldsen cer-
tainly did not excel. His females are much too square in the
frame, the head and shoulders being generally heavy; and
in no instance do we find in his female figures, in full relief, that
beautiful undulation of line and development of form charac-
teristic of the female, which is displayed in the antique, in
the works of Canova, and in those of some other modern sculptors;
as, for instance, the Ariadne of Dannocker. Baso-
rilievo was a favourite style with Thorwaldsen, and a great
proportion of his works are executed in this style. Of this
class some of his minor works are the most expressive; but
the most interesting are his representations of the goddesses
of Delos and of CARTHUSIAC; which is the frieze of the cathedral
church of Copenhagen, immediately below the numerous
figures of the Greek and the Roman order Compositive
molding oblong in one row, with a few additional
molding at the base. The receptacle is punctured, the fruit beaked.
The papaya in two rows, the outer row sepalaceous deciduous, the
inner one longer, feathery and dilated at the base. The
marginal row of fruits is enclosed in the scales of the in-
volute.

T. hirta, the only British species, has lanceolate leaves,
sinuate dentate, hairless or hairy. The leaves are all radical,
sometimes nearly or quite entire, occasionally runcinate. It
is found chiefly in gravel soil.

T. umbellata, the other one 2-leaved, the inner about
30 mm. long, is characterized by its calyx; the outer
3-celled and 2-celled. The species are handsome climbing plants
with a fragrant odour.

T. fragrans has a climbing stem, with cordate acuminate
leaves somewhat angular at the base.

T. griffithii has large flowers with no inner calyx; the
leaves are angular cordate; the anthers bearded and spurred.

This and the former species are natives of the East Indies.

Lindley, Encyclopaedia of Plants.

THUYTES, a genus of fossil coniferous plants from the
oolite of Stonesfield, Colwycombe, Greystoke, and Selen-
hofen (Bromlani)

THYNUS, the subdivision of the genus SCOMBER
(Mackerel) to which the fish called the Tunny belongs. The
Tunies differ from the Mackerels in the position of their first
dorsal fins, which, instead of being separated from the second
by a wide interval, are prolonged close one to the other.
The first dorsal fin is rather shorter than the second, and
at the thorax they have a coryphe of larger scales, a character
which is wanting in the subgenus SCOMBER. The Tunny and Bonito
are the best known examples. The former has nine
spines and five membranous finlets above and below; the latter
has eight above and seven below.

The general form of the tunny resembles that of the
mackerel, but it is thicker in proportion to its length. The
back is black with a white line from the head to the
head are whitish; the belly is grey, with silver spots;
the fins variously coloured; the first dorsal, pectoral,
and ventral are dusky; the tail is rather paler; the second
dorsal and anal more or less flesh-coloured, and the spiny
finlets sulphur-yellow, edged with black. The tunny grows
to more than seven feet in length, and when of those
dimensions weighs more than four hundred and sixty pounds.

The following interesting account of the modes of fishing
the tunny in the Mediterranean is given by Mr. Yarrell in his
'Technology of British Fishes'.

In the months of May and June, when seeking a proper
situation near the shore upon which to deposit their
spawn, the adult fish rove along the coast in large shoals and
are known to be extremely timid, easily induced to take a new
and apparently open course to avoid any suspected danger.
It is believed that this is a result of the small peculiarity to carry
on some elevated spot, makes the signal that he sees the shoal
of tunnies approaching, and the direction in which it will
come, a great number of boats set off under command of a
chief, range themselves in a circle, and joining their nets form
an inclosure which alarms the fish, while the fishermen drawing
closer and closer, and adding fresh nets, still continue driving
the tunnies towards the shore. When they have reached the shallow water, a large
net is used, having a cone-shaped funnel to receive the fish, which is drawn towards the shore, bringing with it all the shallow and small tuns in their arms, the larger are first killed with poles. This fishery, practiced on the coast of Languedoc, sometimes yields many hundredweights at each sweep of the nets.

Another kind of taking tunny is by the madrigue, or, as the Italians call it, tonnaro. This is a more complicated engine, and somewhat expensive to set up. It consists of a series of long and deep nets fixed vertically by cords at their upper edges, and with lead and stones at the bottom. These are kept in a particular position by anchors, so as to form an inclosure parallel to the coast, sometimes extending an Italian mile in length; this is divided into several chambers by nets placed close together, leaving narrow openings on the land side. These tunnies, which in their progress proceed along the coast, pass between it and the tonnaro: when arrived at the end, they are stopped by one of the cross nets, which closes the passage against them, and obliges them to enter the tonnaro by the opening that is left for them. When once in, they are driven by various means from chamber to chamber to the last, which is called the chamber of death. Here a strong net, placed horizontally, can be raised at pleasure, brings the tunnies to the surface, and the work of destruction commences.

Sailors who have come off in boats for the purpose, give unequal battle on all sides, striking the tunnies with poles and harpoons, or using other similar weapons. This is an event which attracts a great number of curious people to witness it, one of the great amusements of rich Sicilians, and at the same time one of the most considerable branches of the commerce of the sea.

When Louis XV. visited Marseilles in 1724, he was invited to a funny-fishing at the principal madrigue of Morgion; and found the diversion so much to his taste, that he often said it was the pleasantest day he had spent in his whole progress through the south of France.

The tunny is occasionally taken in the British seas, but it can scarcely be regarded as more than a straggler. In the seas of the South of Europe, and especially in the Mediterranean, it is very abundant.

The Bonito (Scomber pelamys) of Linnæus, is also an occasional visitor to the coasts of England, but its true realm is in the tropics. It is a very beautiful fish of a fine blue colour, with four dark lines extending from the pectorals along the side of the belly to the tail. It rarely exceeds thirty inches in length. The Bonito of the Mediterranean, a fish of equal beauty, is a distinct species, and is the Pelamys Sarda of Cuvier. Its back and sides are marked by dark oblique transverse bands. It has much stronger teeth than the Bonito of the tropics.

This Sardine, or sardine, is a small fish, usually esteemed as food and not as fish, covered with small scales, which are used as tests for the powers of microscope glasses. They have long scatognate many-pointed antenna, distinct palpi to the mouth, and moveable false feet on the sides of the abdomen; the body is terminated by artculated sets, three of which are especially conspicuous. The Podereile have 4-pointed antenna, distinct palpi, an abdomen terminated by a forked tail, which is folded under the belly when the animal is at rest, and serves to aid it in leaping. They are little, long, soft insects. The Lepisma and Podereile live chiefly among wood or under stones.

Ticorea, a genus of plants belonging to the natural order Rutaceae. It has a small 5-toothed calyx, a monopetalous funnel-shaped corolla with a long tube, and a 5-angled limb, either equal or unequal. The stamens are from 3 to 8, of which from 2 to 6 are often sterile. The disk is cup-shaped, surrounding the ovary; the stigma 5-lobed. T. jussinifolia is a shrub from seven to eight feet high, a native of Rio Janeiro. The leaves are ternate and stalked; the leaflets large, entire, flat, covered with whitish silver, tapering to the base, acuminate, obtuse, deep green with pellucid dots. The calyx is rather downy, the corolla white, downy, glabrous with pellucid dots. A dejection of the leaves is drunk by the Indians as a cure for fever and inflammation.

This is an insect which is common in many countries, in which whatever is warm, and subject to variations of temperature, it is the more abundant. It is called by the Indians fat and pellucid, from the little pellucid dots in its body. It is a very common insect in the United States, and the species is very abundant in America. T. felipugia differs but little in its character from the last species, but in its stem being generally arborescent, its panicles contracted, its flowers not more than half the size, the bracts more numerous and folaceous, and the style more protruded. The
The Report is accompanied by Minutes of Evidence, an appendix of matters relating to the inquiry, and by plans of the river Thames between London Bridge and Gravesend, the river Blyth, Harwich Harbour, and the river Yare, Rye Harbour.

The Second Report of the Commissioners is dated March 20, 1846. It is printed separately, as well as with the Minutes of Evidence, the whole forming a very bulky volume, with numerous plates. The Commissioners state that a more extended inquiry has fully confirmed the views which the limited examination of the previous year led them to. They find that there is not only a great want of suitable harbours and other appendages to the ports, but that such control, in every one of the numerous cases which came before them, would have been the means of saving unnecessary outlay, of preventing encroachment, which is now scarcely remedied, and of preventing the execution of works which it is now expedient to remove.

The income of the various ports of the United Kingdom considerably exceeds 800,000 a year, the whole of which is levied by charters and acts of Parliament, or otherwise, from dues on shipping and on goods borne by shipping, but over the expenditure of which Parliament has not at present the slightest control. After explaining the causes of the misapportionment of much of this money, the Commissioners detail their proceedings since the First Report.

They state that they have examined the chief ports on the east coast of England from the river Thames to the Tyne; that they have also inspected ports on the south coast, viz. at Chichester, Chichester Harbour, Rye, Rye Harbour, Yarmouth, and Lowestoft; and that they have been strongly impressed by the great value of its national harbours and ports as a means of increasing the trade and commerce of the country, and the extent and capability of improvement of its fisheries, which, even in their present state, with the fishery-port in ruins from neglect, afford employment to 19,880 vessels and boats, and 63,800 herring fishers.

The Commissioners next point out in detail the injuries which have arisen, partly from neglect and partly from mismanagement, and which an efficient control would have prevented, in the harbours Dundee, Weymouth, Plymouth, Chichester, Chichester Harbour, Rye, Ribble, and Dee, and the ports of the Isle of Man; that in Ireland they have visited most of the ports and fishing-places, and that they have been strongly impressed by the great value of its national harbours and ports as a means of increasing the trade and commerce of the country, and the extent and capability of improvement of its fisheries, which, even in their present state, with the fishery-port in ruins from neglect, afford employment to 19,880 vessels and boats, and 63,800 herring fishers.

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They point out the damage which several of the breakwaters have suffered owing to bad construction, and the distress which has been occasioned by the neglect of repairing many of the fishing-ports. They cite as instances of neglect the injury done to Bantry Harbour, Skerries, and Larne, by discharging ballast and stones into them.

After advertising to the necessity for additional lights and beacons on the Isle of Man, they proceed to animadvert on the river Ouse, in East Sussex. In the north-west of England, on the river Lune and the port of Lancaster, on the Ribble and Dee and port of Preston, the river Dee and port of Chester; on the south coast, Salcombe, Dartmouth, and Portsea; and on the north coast, the Tyne and port of Newcastle with North and South Shields, Sunderland, Hartlepool, Stockton-on-Tees, Whitby, Scarborough, Bridlington, Kingston-upon-Hull, Grimsby, Great Yarmouth, Norwich, Lowestoft, Beccles on the Waveney, Blackney and Cleve on the north coast of Norfolk, Wells, near Blakeney, and Harwich Harbour.

It appears, from Parliamentary Returns, that the aggregate debt of the several ports of the United Kingdom, exclusive of docks in the port of London, exceeds 4,000,000, and that consequently one-fourth of the whole harbour-income of 800,000, must be annually appropriated to pay the interest of the funded debt. The port of London is, however, so large that the net revenue is so small, and the sum required for its maintenance is so large, that it is evident that the cost of maintaining it will be very great.

The Commissioners then animadvert on the obstruction and shoals which so seriously impede and endanger the navigation of the Thames between London Bridge and Gravesend, arising from neglect occasioned by the conflicting claims of the admiralty, the Trinity House, and the corporation of the city of London. The Commissioners finally urge the necessity of establishing a Board of Conservancy for the superintendence and control of the management of all the tidal harbours of the United Kingdom. They also point out the advisability of constructing a number of new harbours, which would be suitable for laying down a permanent network of harbours for the United Kingdom. The Commissioners further point out the advisability of establishing a Board of Conservancy for the superintendence and control of the management of all the tidal harbours of the United Kingdom. They also point out the advisability of constructing a number of new harbours, which would be suitable for laying down a permanent network of harbours for the United Kingdom.

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form the tesselae, which may be of any required colour, about an inch square, and to combine them into slabs of about eighteen inches square before laying down. In 1840 Professor of Birmigham University invented the oven method of producing a substance similar to, but very much harder and less porous than common porcelain, by subjecting a mixture of potash, fine clay, and fine feldspar, in a dry and non-combustible body, to intense pressure between metal dies, so as to condense the powder into about one-fourth of its natural bulk, and then baking it. This process was first applied to the manufacture of a kind of button which has in a great measure superseded those of bone and mother-of-pearl; being, when well made, beautiful in appearance, and cheaper and far more durable than common buttons. Mr. Blaistow's process has been adopted in the peculiar fitting for making tesserae for pavements, and the manufacture has been commenced by Mr. Minton with every prospect of success. These compressed tesserae are made by a simple but powerful machine, which concedes the material from a thickness of about an inch and one-eighth to three-tenths of an inch, and are then baked in an oven; and it was stated by Mr. Blashfield in an experimental lecture before the Society of Arts (reported in the 'Athenaeum' of 1843, p. 266), that they had been found to bear a pressure of forty tons, and to be proof against injury by frost, some having been tried by plunging them in boiling water and immediately exposing them to a freezing temperature. Blue and green tesselae are imparted by metallic oxides during the baking process; but other colours are mixed with the materials before submitting them to pressure. By this process tesselae are produced of such perfect uniformity of shape, that when fitted together they unite much more perfectly than those used in ancient pavements, in which the beauty is often impaired by bread and irregular lines of cement. In constructing pavements with them, the tesserae are arranged, face downward, upon a smooth level surface, and, when a convenient portion of the design has been thus adjusted, a stratum of Roman cement is laid upon the back, and worked into the joints so as to form a foundation upon which the tesselae are laid in. In the case of Singer's plan this mode of producing tesselated pavements possesses many advantages over the antient plan, in which, a level foundation having been prepared by cramping stones together, or forming a thick floor of stucco or concrete, a layer of plaster was spread to receive the tesselae, which were laid one by one while the plaster continued soft. This method required much time and care to preserve the level, and as that could not be done perfectly, much additional labour was involved in the subsequent rubbing down and polishing of the surface, an operation which, in the case of vitrified cover, would have added much to the expense of destroying their hard surface. Owing to the imperfect fitting of the antient tesserae it was also necessary to spread cement upon the surface of the pavement, in order to fill up the joints and crevices, and afterwards to scrape it off again.

By Proser's process, with the power supplied by an hydraulic press, bricks and other large tiles may be produced, amoug which may be mentioned slabs, inlaid with coloured devices, for chimney-pieces and other architectural decorations.

An extensive collection of specimens of Roman tesselated pavements, in a very large atlas folio, published by William Fowler early in the present century, together with specimens of antient stained glass, is worthy of the attention of those engaged in the revival of this elegant species of decoration, which, though necessarily expensive, has been so much reduced in cost by the introduction of the compressed tesserae, that in some cases tiffs have superseded the use of oil-cloth in the construction of public buildings. The substitution being effected on the score of economy, although sanctioned by a refined taste.

TIMBER, PRESERVATION OF. Whatever other causes may combine to promote the decomposition of wood by the agency of fungi, it is a fact that under certain forms of decay there can be no doubt that imperfect seasoning, by leaving in the pores of the timber a large portion of the fermentable juices always found in recently-felled timber, is one of the most potent agents. There is no process more essential in promoting the durability of wood as it is in lessening the tendency to those changes of form and bulk which so greatly increase the difficulties of the carpenter and joiner. The process of seasoning usually consists in the exposure of the timber to the action of air in a dry situation, in stacks or piles so constructed as to allow the free circulation of air in contact with as much as possible of the surface of each piece; until, if the sap or vegetable juices shall have dried up so far as to offer but little food for the multiplication of the microscopic fungi which constitute various kinds of rot. In order to the success of this operation it is important that the timber should be so arranged that the surface of each piece may be as far as practicable on the ground as to allow the circulation of air beneath as well as above it; and also that, if exposure to rain be not entirely avoided, care be taken to prevent the lodgment of moisture in any place where it is likely to cause the growth of fungi. Improvements in this respect have, of late years, been introduced in our dockyards, in the stacking of timber upon elevated supports of iron or stone, and the building of ships upon similar foundations beneath. In all such cases, where the climate is mild, while they allow an unimpeded current of air around them, in the article Horset, pp. 58 and 54 of this volume, we have noticed a very simple, though not unimportant, improvement upon the common method of seasoning flooring-boards. Kindly, and the expulsion of sap by charring or scorched the surface of the timber, have also been tried, but without success, as substitutes for the tedious operation of natural seasoning.

Another process, which may seem at first sight very unlikely to succeed, and respecting which indeed the most contradictory opinions are given by writers on the subject, is the preservation of timber by lengthened immersion in sea-water, and subsequent drying. Immersion in sea-water especially has been extensively practised of late years; and it is stated that a large portion of the timber in some regions has been preserved in this treatment has arrested, the action of the sea-water appearing to destroy the vitality of the fungi. Some authorities however state that ships built of timber which has been so immersed, as but little consequence of the bygymetric properties acquired by the absorption of salt.

The protecting power of metallic oxides, when applied to the surface of wood in the form of paint, is well known; and many abortive schemes for the preservation of timber have been devised to act upon the same principle, which is that of excluding such external influences as might promote decay. To imperfectly seasoned timber however such applications are worse than useless, because by filling up the pores they impede the natural drying of the vegetable juices, and therefore rather promote than check internal decay. Far more efficient than these are the numerous modes of protection which involve the impregnation of the timber with some antiseptic substance, or with such matters as, by pre-occupying the pores, may render the reception and germination of destructive fungi mechanically impossible. Historical notices of the application of many powerful disinfecting materials are also in 'Mecaniche's Magazine,' vol. xxix. pp. 346-350, extracted from a report made in 1843 by a committee of the Franklin Institute, on the best method of paving highways; and in a paper previously in the same work. (See also our report of an interesting conversation on the subject, at a meeting of the Institute of Civil Engineers, in 1842, when several of the principal modern inventions were discussed. Of plans for protecting timber by impregnation, perhaps none has attained such general celebrity as Mr. Kyan's, which was patented in 1832, and has been very extensively practised under licences granted by the Anti-Dry-Rot Company. The preservative agent in this process is bi-chloride of mercury, commonly called corrosive sublimate, which is dissolved in water, and forced into the pores of the timber, in closed tanks, by means of force-pumps, and which combines with the albumen of the wood, and converts it into a compound and capable of resisting the ordinary chemical changes of vegetable matter. The idea of using corrosive sublimate for this purpose appears to have originated with Mr. Kyan; that substance having been tried and recommended as an anti-dry-rot application by Sir Humphry Davy many years previously. The alleged failure of the precipitate formed by potassium salts of Kyan's having prompted to the action of sea-water, led Sir William Burnside, with the view to preserve timber when exposed to the action of sea-water, led Sir William Burnside, to test the power of preserving timber by immersion in sea-water, and the success of this treatment has been announced. Sir John Barrow has recommended the application of creosote, obtained from the distillation of tar, and applied in the form of gas, by which it may be made to penetrate to the heart of the largest logs. This treatment renders the wood exceedingly hard, so much
so indeed as to render it difficult to work. An oil extracted from
chips and refuse wood was used for the same purpose by
Mr. Macdonochie in 1803. He applied it by placing the tim-
bers in the fire, several of the ashy fragments and ashes
rubbed between the pores of the timber by the admission and subsequent con-
denstation of steam; and, after repeating this process as often as
needful, plunging the timber into the oil, which filled the ex-
posed parts of the wood. Encyclopaedia Brittanica, in a
paragraph which is given under 'Wood-Preserving', in the
'Supplement' to Dr. Ure's 'Dictionary of Arts, '&c., ap-
pears to be somewhat similar, although the impregnation is ef-
chanted by spraying or 'drenching'. Sacrificing the
forcine he injected fluids into the pores by hydrostatic pres-
sure. Dr. Ure mentions the application by this process of
oil of tar and other bituminous matters containing crocoite, and
sulphur of iron, which holds more crocoite in solution than any other water solvent. For railway
sleepers, piles, posts, and fencing, this process has been ex-
tensively and most successfully employed, as timber protected by
it is not affected by exposure to alternate wetness and
dryness; while the commonest and cheapest Scotch fir
is rendered superior to the best and hardest wood in an un-
protected state. In the discussion at the Institute of Civil
Engineers above alluded to the efficiency of coal-tar in pre-
paring ship-timbers was particularly mentioned. It was
stated to be superior to vegetable tar, and its efficacy in
reserving the timber, was ascribed to the sulphurous
bony or sulphone acid, which is highly destructive to
animal and vegetable life. Piles protected with coal-oil were
stated to have resisted the attacks of the teredo better than
those treated with other materials. It is curious, however, to
observe that the coal must be deprived of its ammonia, which
would produce immediate decay if thrown into the timber. In
Mr. Bill's method, tried about 1822, some large logs were
impregnated with asphaltum; and a five years' immersion in
the dry-rot pit at Woolworth showed that timber thus pre-
pared would withstand the fungus-rot, while unimpregnated tim-
ers were destroyed in one-fifth of the time. M. Pallus, in
1779, proposed to mineralize, by steeping it to saturation in
green vitriol, and precipitating the vitriol by means of lime-
water; and in Payne's recent process it is proposed, by the
application of both exhaustion and pressure, to impregenate
wood with metallic oxides, alkalis, or earths, and, by decom-
pozing them in the pores of the wood, to form new and in-
soluble compounds. The writer has seen specimens of wood
which appeared to be almost alkali- or fossilized by this
method, by which the softest woods may be rendered harder and
denser than the hardest in their natural state, apparently
indestructible by any ordinary process of decay, and, for all
practical purposes, incom-bustible. In addition to its anticipated
utility as a means of preserving wood, it may prob-
able be useful in increasing the value of many soft and
rapidly growing woods, by rendering them applicable where
hitherto none but costly woods could be employed. In 1849
Dr. Liebig's studies on the impregnation of wood by
Sciences on the application of pyroligneous iron (which had
previously been used in this country by Mr. Bethell, as abo-
mentioned), or of other metallic salts or earthy chlorides, by a
process which had already been practiced in the
lowering the end of the tree, as soon as it is felled, in the
solution, which is thereby drawn into the pores by what may be
considered as a continuation of the natural process of circula-
ion. Unless performed immediately after felling, the process
will not answer, as the power of absorption becomes very
shortly impaired. Other plans have been tried for effecting
impregnation from one end of the timber, in some cases by
attaching a water-pump to the tree, thus bringing the fluid to the upper-
end, and thus causing the preserving liquid to trickle down
through the substance of the wood, until it drops from the lower
end. In connection with all such schemes it is well to re-
member that the results have been attained with the assistance of
a valvular structure in wood, namely, that if a trunk be ex-
posed to a running stream, with its butt towards the current, its
vegetable juices will be drawn away, whereas if it be laid in the opposite direction.
Dr. Bocherie proposed by his process to fuse such liquids as might prevent dry-rot,
warping, and splitting, such as should reduce the inflammability of
the timber. The process has been proposed to wood by
un-odour; and it is evident that the same objects might be
affected by many of the other modes of impregnation which
have been suggested. Mr. Bushell, for example, proposed, in
one of his patent processes, to coat the outer
of a double glass, which when heated and
protecting film or glaze, impervious to the further action of
fire.

A popular article on the preservation of timber, in which several of the above processes are described, was given in the
'Penny Magazine' for 1844, p. 185; and much information on
the subject is contained in the article 'Ship-Building', and some
other articles of the same kind, in the seventh edition of the
'Time'.

TIME. A reference has been made to this head from the word
FUTURE. Time as expressed by the different forms of
verbs is considered in the article CONSTRUCTION, P. C.

TISSUES, ORGANS AND SUBSTANCES. In the present section we propose to
take a brief sketch of the chemical physiology of the organic
kingdom. We commence with the consideration of the origin of
those substances which are common to plants and to animals,
or which exist in one of them only. The first division
contains protein; the second embraces cellulose in plants, and
gelatin in animals. We shall show that these substances and
their derivatives yield the foundations of the animal and
vegetable kingdoms.

Protein is undoubtedly the most important of all known
substances in the organic kingdom. It is present in all parts
of plants, in roots, stems, leaves, fruits, and in their
several juices; in the animal body it is the chief constituent of
the blood, the muscles, and many other parts, and is the original
material of all the others. Dr. Liebig has shown that,
see Cuzzocras, and in this work he has been directly prepared for the food of plants, and is found in
the youngest roots; whether it is only formed there, and afterwards
conveyed to the other parts, or whether it is produced in any
other part of the plant, is uncertain. Its property of being
readily soluble in water facilitates its transference to the
various organs. It may however assume the solid state and
become deposited in cells; in this form it occurs in many
seeds, occasionally being their principal constituent. This
deposition is effected in a very simple manner. Most
acids render it insoluble, and therefore the mere presence of an acid
is usually sufficient to accomplish the transformation: again,
the insoluble protein may be redisolved by alkalis, and
hence, after it has been deposited in the cells in a solid state, it
may be removed to another part of the plant through the
medium of an alkaline solution.

Whether protein can be formed within the animal body is
uncertain, but it cannot be doubted that the protein
compounds in vegetables are imparted to animals in their food,
and as these compounds form the principal component parts of the
animal body, this constituent must be supplied either wholly
or in part by plants.

The protein-compounds existing in plants were till quite
recently known as soluble albumen, coagulated albumen,
leucin, and gliemin, and given names denoting the
three first the names vegetable albumen, vegetable fibrin, and
vegetable casein, assertering that they are identical in their
physical properties and in their chemical compositions with
the corresponding substances in the animal kingdom. The
discovery of protein, denies the accuracy of this statement.
'The special character of these animal substances is, he remarks,
determined by the small portions of sulphur
phosphorus they contain, by which they differ from each other and
from pure protein. The proportions of sulphur and
the three vegetable substances are still unknown;
and therefore the names proposed by Liebig cannot be applied
them. Moreover, the vegetable albumen and leucin
iffer so much from animal fibrin and cassein, both in form and appearance,
that they ought not to have a similar name.' We
shall retain the former names, representing them as the
substance which is precipitated in white flocks, when the infusion of
crushed peas or beans in warm water is mixed with an
acid.

By soluble vegetable albumen we mean to designate that
substance which, being soluble in water, is precipitated from
the juices of plants by heat, alcohol, or acids. It is soluble
in weak alkaline fluids, from which it is precipitated by acids,
alkalis, and, independently of any other means, by
the same composition as protein. By coagulated vegetable
albumen we mean the compound of protein, sulphur, and
phosphorus which is insoluble in water; it exists in the seeds
of the cereals, by which it is known to be composed,
and the substance which can be extracted by alcohol from

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ordinary gluten obtained by washing away the starch from flour. It is the same substance as is described in the article CHEMISTRY, P. C. S., as dextrine. Its composition according to Mulder is 10 (Ca H$_4$ Ni O$_5$) + $S_r + 10$ F + $S_r$; or F + $S_r$.

The protein-compounds contained in the animal body, as far as we yet know, are the following:--

**Fibrin** from blood is composed according to the formula 10 (Ca H$_4$ Ni O$_5$) + $S_r + 10$ F + $S_r$; that is to say, every 10 parts of its constituent materials consist of 10 valents of protein with one each of sulphur and phosphorus.

**Albumen** from eggs has a similar composition.

**Albumen** from the serum of the blood is represented by 10 (Ca H$_4$ Ni O$_5$) + $S_r + 10$ F + $S_r$; that is to say, it differs from fibrin in containing one atom more of sulphur.

**Casein** from cow's milk, 10 (Ca H$_4$ Ni O$_5$) + $S_r + 10$ F + $S_r$.

**Crystallin**, the substance that forms the principal constituent of the lens, 15 (Ca H$_4$ Ni O$_5$) + $S_r + 10$ F + $S_r$.

These are all the protein-compounds of the animal body yet known. The muscular fibre is for the most part composed of a protein-compound, fibrin, which likewise exists in the circulating fluids; and albumen occurs in the blood and other substances of the body in the composition of the blood. The above compounds of protein enter into some very important combinations, a few of which, from their physiological bearings, we shall here notice. The combinations of the protein-compounds of fibrin, albumen, casein, with alkalies, acids, and salts, are especially remarkable. Protein is soluble in weak alkalies, and according to Mulder it exists in the blood in a state of combination with sulphur and phosphorus. Enderlin and the Gieson school, on the other hand, deny that it exists in that fluid as protate of soda. They assert that the cause of the alkalinity of the blood is the presence of the ordinary tribasic phosphates of soda—a salt which has the power of dissolving the protein-compounds: the question whether Mulder or Enderlin be correct is still undecided.

C—neutralizing a weak alkaline solution of protein by an acid, its solubility is greatly diminished; a fact which Mulder regards as elucidating the medical properties of certain acids. The sulphuric and phosphoric acids for instance possess the property of stanching blood; acetic acid, on the contrary, by which protein is readily dissolved, is destitute of that property. Very dilute hydrochloric acid occurs in the stomach, and as it possesses the property of dissolving protein, it doubtless renders the food (at least the portion consisting of protein-compounds) tender, and thus assists digestion. Some acids enter into combination with the protein-compounds, producing comparatively insoluble bodies. For this reason certain vegetable substances and hydrochloric acid are very effective in curturing fevers, scurvy, &c. As an illustration of the combinations of the protein-compounds with salts, we may notice that of bone-earth with casein. Bone-earth is a phosphate of lime and of oxalic acid, and contains, according to the formula 3 P, O$_2$, 8 Ca O. In casein, and therefore in milk, it exists in great quantity, and this seems to supply a large amount of earthy matter to the tender bones of young animals.

In addition to albumen and fibrin, a third protein-compound exists in the blood, constituting the cell-walls of the corpuscles. It is termed globulin. Its real composition is unknown: Simon regards it as casein. All these protein-compounds contain more or less phosphate of lime, which thus finds its way to the bones.

Two other very important protein-compounds exist in the animal body, namely the binucleotone and trinitrogenate of protein. They both exist to a large amount in the blood in inflammatory diseases, and to a small amount in healthy blood. The latter is soluble in water, the former is not. (For the mode of obtaining them in a state of purity, and for the fullest account of them in the English language, we must refer to Dr. Day's Introduction to Simon's 'Animal Chemistry,' published by the Sydneyham Society, London 1845.) At every reaction of the protein in the blood-processes and in the blood-compound and Mulder (who must be regarded as the highest authority in all that relates to protein) believes that they form around the blood-corpuscles a thin layer having the same composition as the albumen or inflammation.

The above sketch is sufficient for our purposes at present. In a later part of this article we shall have occasion to return to the protein-compounds. We now turn to the second group, commencing with the consideration of cellulose, or the cellular tissue or substance. As the morphological properties of these substances have been fully discussed in the article TISSUES, VEGETABLES, we shall confine our observations to the chemical characters and metamorphoses of this substance.

This organic compound may be prepared from all the parts of plants without exception, by dissolving (by certain agents) the other substances associated with it. Pure cellulose is easily obtained from the pith of the elder-trees, or from the spongy vascular vessels of trees, by treating them with acids, peracetic acid, and water, the cellulose, which was previously solid and dense, assumes a spongy appearance. As a proof of its constant composition, it is worthy of mention that the following substances, previously purified in this manner, gave similar results, viz. the ovula of almonds, of apples, of the Helianthus ananassus, the sap of cucumbers, the tissue of the cucumber, the pith of the elder-tree, the pith of the Zaschoyledonea pumila, the wood, the leaves of endive and of Ananthus glanulosus, the tracheum of the Buceas caprensis, films from the pith of oak-trees, cellulose from cow-dung (the cow food with meadow-grass), the internal tissue of the fruit of Agave americana, the succulent of the Physalephas, extracted lichen, membranes of the Chare, &c. From these and various other substances, the purified cellulose always gives a result approximating to the above, it is thus evident that the proper tissue of all plants leaves a substance which is identical for all of them,—a substance which contains carbon and the elements of water, which is insoluble in water and in organic solvents, and which is therefore easily convertible into starch and sugar; and that in its turn it may easily be produced from dextrin (CHEMISTRY, P. C. S., p. 345), the change consisting only in the loss or gain of the elements of water. It has been recently shown by Von Baumhauer (in Mulder's Laboratory) that sulphuric acid or diastase will convert cellulose into dextrin. Hence the cellulose of these plants, being easily converted into dextrin, may fairly be reckoned among the substances which are most serviceable in maintaining the vital functions of animals.

Further, as cellulose exists ready formed in the youngest parts of plants, it belongs, together with protein, to the first and oldest vegetable substances. It consists, according to Mulder, from solid particles or dissolved in the liquids with which their organs are permeated. In plants the cell-walls are composed of cellulose, and the plant-tissue is the composition of cellulose and other substances; in animals, as well as in plants, the cellular substance is the chief agent in connecting all the other existing organs.

Mohr and Nebenlein have shown that the cellular membrane of many parts of plants is coloured blue by iodine, just as if it contained starch. This apparent identity of re-action would
lead us to infer that cellulose can often be modified as if it were into starch, though still retaining the appearance of cellular membrane. The similarity of the chemical constitution of these two substances renders their conversion apparently easy.

For 1 eq. cellulose \((C_{n}H_{2n}O_{n})\) = 2 eq. starch \((C_{n}H_{2}O_{n})\) + 1 eq. water \((H_{2}O)\). Hence, by a separation of water, the starch formed from the cellulose may be converted into starch; and conversely, by the absorption of water, starch may be converted into cellulose.

Dextrin exists in two more or less definite forms: common starch, lichen-starch, and inulin. The first is intermediate between dextrin and cellulose; the second, between dextrin and common starch; and the third, between common starch and sugar.

Of the two forms of dextrin, which are found in the most different parts of plants, and present varying forms in consequence of having to adapt themselves to the shape of the cells in which they have been deposited. It has been frequently observed that starch-globules, after being deposited, again disappear under the influence of growth; that is to say, they become dissolved and carried away to other parts by the sap, and give origin to new products. In young parts of plants, such as the extremities of the radicle, no starch is present, but only cellulose and protein-compounds; hence, it is not formed till after the parts in which it has to be deposited have obtained a certain growth. Payen could not detect any starch-globules in the cellular canals of the young twigs of the birch, nor in the cells of the leaf veins of tobacco, or in the hypocotyls of pea-seeds, as far as the eye of the microscope goes; hence, if starch is present, it must occur in a dissolved state, or in a modified or changed condition. It is further worthy of remark, that in those bulbs in whose scales there is much starch, starch is dissolved when the scales are exposed to light; that is to say, it becomes converted into other substances. This is the reason why much less starch is to be found in the parts of a plant which are above-ground than in the roots, and that in plants whose stalks contain starch it is found chiefly in the pith. We have already mentioned that starch-globules may be dissolved wholly or in part during the growth of the plant. According to Payen the products of this metamorphosis are dextrin and sugar, the carbo-hydrates of action dextrin, a substance the effect of which on starch separates from plants is now well known. This is the change which frozen potatoes undergo when all the starch is converted into sugar. It also takes place in the growth of new potato-plants; all the starch disappearing from the tuber, and being replaced by sugar. According to De Candolle, the quantity of starch in potatoes increases during their ripening almost in the same degree as it afterwards diminishes. In August, 100 lb. of potatoes gave 10 lb. of starch; in September, 14-8 lb.; in October, 14-75 lb.; in November, 17 lb.; it remained constant till the end of February; in April it had diminished to 13-76 lb.; and in May, to 10 lb.

There is still considerable mystery regarding the formation of starch. We have no doubt that it is the result of the respiration of the plant, and it is very certain that the same substances may, under different circumstances, form starch. In addition to its uses in forming dextrin and sugar, it is likewise the efficient agent in the production of fat and of chlorophyll.

Lichen-starch. The starch of the cryptogamic plants has been examined by several chemists, especially by Vogel and Dietrich. It is coloured green by iodine, instead of blue, and in several other points differs from ordinary starch.

Inulin is a modification of starch, very abundant in the dahlie, helenium, and taraxicum, but found also in many other plants. [Chemist. P. C. S. p. 345.] It is very readily converted into sugar, and as it combines with this sugar and carries it with it, it is obvious that ultimate analyses of inulin from different plants must vary. Possessing apparently the same composition as starch, it differs in not being changed by the action of malt, in not being reduced to the blue with iodine, and yellow. It may as well be termed a variety of sugar insoluble in cold water and destitute of taste, as a variety of common starch. From the facility with which it may be converted into sugar it is simply starch consisting of sugar and common starch. In many plants dextrin is a transition substance from common starch to sugar, as is the case when either sulphuric acid or diastase [Chemist. P. C. S., p. 345] is applied. It is here that the starch is converted into sugar, and the blue with iodine, but without formation of dextrin. As its composition is the same as that of cellulose, it is probably produced from that substance and not from starch.

From starch we are led to consider dextrin a very important constituent of plants, dextrin, which is obtained by treating starch with diastase. [Chemist. P. C. S., p. 245.] Mulder has shown that dextrin may also be obtained from cellulose both by sulphuric acid and by diastase. The quantity of diastase required for the conversion of cellulose into starch is extremely minute; if too much be used, or the process continued too long, grape-sugar is produced. It is by these or similar means that nature converts cellulose into dextrin, and dextrin into starch. As in making barley-dextrose in the brewery, if the starch be too strongly devitalized, the reason why it should not in a similar manner be produced in the growing plant, and thus convert the cellulose into dextrin.

The sap of nearly all plants contains a certain amount of dextrin, which, having the same chemical composition \((C_{n}H_{2}O_{n})\) as gum, and in many other respects resembling it, has been in most cases converted into gum, the equivalent of water \((H_{2}O)\) taken from one equivalent of cellulose \((C_{n}H_{2}O_{n})\) is formed. Thus a part of the cellular membranes may be converted into dextrin by catalysts [Chemist. P. C. S., p. 341] without destroying the cells, if the vegetable sap, while passing through them, contains only a very minute quantity of diastase, or of a substance resembling it.

We have already mentioned that gum and dextrin have been frequently confounded. The most important difference between them is, that the latter may be changed into grape-sugar by sulphuric acid or diastase, while the former is incapable of undergoing this change.

Dextrin belongs to the nutrient matters; all the starch taken as food being converted by the gastric juice into it. The gums are mere excrescences, and are apparently of little or no importance in part or altogether of the cells.

There seems every reason for believing that dextrin is the source of the cellular matter, for it is a universal constituent of all parts of plants. We are justified in assuming that the formation of starch and cellulose is a very common process in a state of solution, so as to be able to penetrate through the cell-walls, and to supply new substance to increase the number of cells. No material but dextrin is fitted for this office, thought in young organs sugar also contributes to it. By the production, during germination, of dextrin and sugar, we are led to believe that the cellulose of the young plant is really formed from this dextrin and from the sugar in the germinating cotyledons. While many full-grown plants do not contain sugar, all contain dextrin, so that the use of the latter in the formation of cells cannot be doubted.

Dextrin is not merely a source of cellulose, but likewise of starch, sugar, gum, and perhaps other vegetable substances; it is almost as valuable to plants as protein is to animals, for it is a constituent from which their organism derives its most important products. The composition of dextrin being \(C_{n}H_{2}O_{n}\), the formation of cellulose is accomplished by every two equivalents of dextrin taking up one equivalent of water. Thus

\[
2 (C_{n}H_{2}O_{n}) + H_{2}O = C_{n}H_{2}O_{n} = \text{cellulose.}
\]

Starch and gum contain the same elements in the same proportions as dextrin, and hence for their production require merely a re-arrangement of the molecules.

Sugar, as we shall immediately show, requires only the addition or subtraction of water from the elements of dextrin.

The different species of sugar, as far as they are yet known, are—

<table>
<thead>
<tr>
<th>Sugar Type</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Milk-sugar</td>
<td>(C_{n}H_{2}O_{n} + 5 H O)</td>
</tr>
<tr>
<td>Case-sugar</td>
<td>(C_{n}H_{2}O_{n} + 2 H O)</td>
</tr>
<tr>
<td>Grape-sugar</td>
<td>(C_{n}H_{2}O_{n} + 2 H O)</td>
</tr>
<tr>
<td>Eucalyptus-sugar</td>
<td>(C_{n}H_{2}O_{n} + 2 H O)</td>
</tr>
</tbody>
</table>

Milk-sugar is an integral constituent of the milk of the mammalia, and has very rarely been met with anywhere else. It has recently been detected in eggs during the process of incubation; but this observation requires to be confirmed. Case-sugar is the most closely related to dextrin differing from them merely by one equivalent of water. It is not by any means so widely distributed as grape-sugar, being found in very few plants besides the sugar-cane, beet, and canna. Grape-sugar is identical with the sugar of the grape, and in diabetic urine, and with the glucose or fruit-sugar of the French chemists. The uncrystallizable sugar which is obtained during the decomposition of many plants, and which is yielded by starch on being acted upon by diastase or sulphuric acid, has the same composition as grape-sugar.

Eucalyptus-sugar is a species of manna produced in Van Diemen's Land by various species of eucalyptus. Whether it...
TIS 636 TIS

is the natural sap spontaneously escaping, or whether it is the sap extracted by the locust and afterwards excreted, is un-
certain. Its property has been carefully examined by Professor Johnston of Edinburgh.

There is obviously an intimate connexion between these different kinds of sugar, as cellulose, starch, demineralized, and gum. They all contain carbon, in combination with the elements of water. As they all contain C₄₈, or a multiple of it, they are produced from each other by a simple change depending on catalytic force. [Chemistry, P. C. B., p. 341.]

If sulphuric acid is allowed to act on gelatin, a species of sugar containing nitrogen, and termed glyccidol or gelatin sugar, is formed. The formula is C₂₀ H₄₁ N₂ O₅; and it is worthy of remark that if from two of its equivalents we deduct one equivalent of cane sugar, we obtain the elements of two equivalents of urea, or

\[ \text{C}_₂₀ \text{H}_₄₁ \text{N}_₂ \text{O}_₅ \rightarrow \text{C}_₈ \text{H}_₄ \text{N}_₂ \text{O} \rightarrow \text{H} \quad \text{or} \quad \text{C}_₂ \text{H}_₄ \text{N}_₂ \text{O} \]

This relation leads to the belief that sugar is a component part of the gelatinous tissues, and when separated from them it may be presumed to discharge the same functions as when either cane or grape sugar is supplied with the food. In other words, there exists in the substances yielding gelatin a primary matter which also exists in cane-sugar. If then substances or tissues containing gelatin are employed in effecting the conversion of diastase continually operating in the animal body, this primary matter may serve the same purpose as cane-sugar when supplied to feed the body. On these grounds Mulder considers that gelatin in the alimentary canal should be classed among the soluble sugars.

If gelatin be formed in the animal body, then sugar, either derived directly from the food or produced from starch in the alimentary canal, may be used in its place.

It is not known in what part of the plant sugar is formed. Mr. Knight states that birch sap contains more sugar the farther from the root it is collected; this proves to show that the sap, which probably contains much dextrin, is changed into sugar as it passes through the cell-walls. When sugar accumulates in certain parts of a plant, it almost always remains in solution; it is however found crystallized in some few instances, as in the seeds of Fritillaria and Nigella. Closely allied in its chemical composition to sugar is a peculiar substance which is termed mucilage is given. Although insoluble in water, it assumes the appearance of a mucilaginous mass when immersed in that fluid. It sometimes accumulates largely in certain parts of plants, as in the periderm of quince-seed, lint-seed, &c.; it is the chief constituent of the gums tragacanth and bassonum, and is abundant in various roots, as for instance the mallows. According to Mulder's analysis it must be represented by the formula C₄₀ H₁₅ O₅. It has been shown by Schmidt that mucilage when digested with dilute sulphuric acid is converted into sugar. There is a close analogy between the following series of analogous substances:

Grape-sugar and fruit-sugar \[ \text{C}_₄ \text{H}_₈ \text{O}_₄ \]

Cacao sugar, sucrose, and inulin \[ \text{C}_₁₂ \text{H}_{₁₈} \text{O}_₉ \]

Starch, dextrin, gum, inosuline and inulin.

lichen-starch \[ \text{C}_₄ \text{H}_₈ \text{O}_₆ \]

Mucilage, milk-sugar, and cuculapta-sugar \[ \text{C}_₇ \text{H}_₆ \text{O}_₆ \]

Cerneine \[ \text{C}_₈ \text{H}_₄ \text{O}_₄ \]

In its physical characters the product of the mucous mambrane of the vegetable body resembles vegetable mucilage. Owing to its insolubility in water, both these substances serve to cover denuded parts of animals, and thus are both well suited to lessen or prevent the influence of acrid matters on the tender parts of the animal frame. It is for this reason that the mucilage of sandle, tragacanth, &c. may be made, in certain proper conditions, to supply temporarily the want of animal mucus. In chemical composition they are perfectly distinct, as animal mucus contains nitrogen. The mucus of the animal body seems however to differ according to the organs by which it is produced. (Daily edition of Simon's Animal Chemistry, vol. ii. p. 78, note.)

We now arrive at a peculiar group, occurring both in the vegetable and animal kingdoms—the fats.

Sesame, maragia, and olein are the most widely distributed fats in the organic kingdom, but they are not the only ones. They were formerly regarded as salts formed by fatty acids with glycerin. [Cowper, F. C. S., p. 344; recent investigations have however shown that this view requires a slight modification. Bernouci thinks that glycerin does not exist ready formed in the neutral fats, but that it is a product of the formation of soap; and he considers the base of the neutral fats to be the oxide of a radical (C₃ H₆) which is known lypile. Glycerin is then formed from two equivalents of water (C₂ H₄ O₄) + 3 H₂ O = C₃ H₈ O₆. (If to this we add one equivalent of water, we obtain the formula given in Chemistry, P. C. B., p. 344.)

According to this view, which is supported by Redtenbacher, Vaurrent, and Mulder, the base of every neutral fat yielding glycerin is a compound which is represented by C₂ H₄ O₂.

The most important of the fatty acids are:

- Stearic acid \[ \text{C}_₈ \text{H}_{₁₄} \text{O} + \text{H} \text{O} \]
- Margaric acid \[ \text{C}_₈ \text{H}_{₁₂} \text{O}_{₂} \]
- Oleic acid \[ \text{C}_₈ \text{H}_{₁₀} \text{O}_{₃} \]

These are universally diffused in plants and animals; and, combined with the oxide of lypile (C₃ H₈ O₆), they form the natural fats—stearin, margarin, and olein; and this is the form in which they mostly commonly occur in the organic kingdom. Sometimes however a more powerful base (potash, soda, &c.) removes the oxide of lypile, and there are formed compounds of the fatty acids with alcalis.

In connection with this subject Mulder observes that when salad-oil is conveyed into the stomach, it may pass unchanged into human fat, for both consist of margarin and olein, although in different proportions; and as margarin and olein are found in many vegetables used for food, nothing is simpler than to assume that these substances are directly transferred, without change, into the fats of the animal body.

But if these same vegetables are eaten by a sheep, the same olein and margarin may undergo some change in the animal, since mutton-fat contains a large amount of stearin.

In this case the change is easily understood. For 2 eq. of margaric acid \[ (\text{C}_₈ \text{H}_{₁₂} \text{O}_{₂}) \] = 1 eq. of stearic acid \[ \text{C}_₈ \text{H}_{₁₄} \text{O} + \text{H} \text{O} \] = 1 eq. of oleic acid \[ \text{C}_₈ \text{H}_{₁₀} \text{O}_{₃} \].

Thus, from two equivalents of margarin acid, one equivalent of stearic acid is produced, and one equivalent of oleic acid is given off. In all probability, such a degradation of the margarin acid in the food of the sheep is really effected; and on the contrary, when mutton-fat is used for food by man, stearic acid is most probably converted into margarin acid by the absorption of oxygen. It is now believed by our first physiologists that neutral fats are not directly form fatty tissue, but that they enter the blood in aaponified state. In fact the alkaline character of the bile as it enters the duodenum renders it impossible for the fat to enter the blood without undergoing this change. If it is aaponified, we readily understand how compounds of fatty acids and soda should exist in the blood and in various parts of the body. When a soda-soap however exists in the blood, it cannot form a neutral fat, except bapanified or olein, without combining with glycerin. This leads to the inquiry, in the first place, whether these soaps meet with glycerin; and secondly, if they do, whether the glycerin would combine with the soap and form neutral fat. Here is a strong reason for believing that both these questions may be answered in the negative, for the glycerin set free when the soaps-soap is formed most probably at once decomposed; and further, glycerin will not remove the soda from the fatty acid and form a neutral fat.

It has been suggested by Mulder, that although glycerin will not remove the soda from the crude lypile in a nascent state may do so, and that in this manner the fatty acids may be converted into neutral fats and deposited in the cellular tissue and other parts of the body. We have already shown (according to the opinion of Berzelius) glycerin is the oxide of the radical (C₃ H₆) lypile. The second oxide of this radical exists in lactic acid, which is supposed by the great majority of chemists to be present in most parts of the body. When lactic acid (C₃ H₄ O₃) is sublimated, we obtain a white sublimate, the composition of which is C₃ H₄ O₂; while the composition of the oxide of lypile is C₃ H₆ O₆.

It may happen that there are causes of dioxidation at work in the system, by which some of the substances usually converted into lactic acid are made to produce oxide of lypile, which in the nascent state unites with the fatty acids, forming neutral fat.

Hence in all probability the neutral fats are not deposited directly and unchanged in the cellular tissue, but are first saponified, and entering the blood as maragia and oleate of soda, are again reduced to neutral fats by the influence of lactic acid.

In many parts of plants, especially in the periperia of some fruits, a fatty matter (popularly known as wax) occurs. It has been known to exist in plants, but it has only recently
been shown that bees can prepare it from honey, which does not contain any fat, and plants their beautiful purple bloom; it abounds in the skins of apples, and is a component of the green colouring matter of leaves (chlorophyll), of which we shall presently speak. It is an oil, which collects on the surface of the sugar-cane, and to which he has given the name ceresia. He mentions an important peculiarity in connection with it, namely, that those kinds of sugar-cane which contain much sugar give this oil, whereas conversely, those which contain much ceresia have but little sugar. From this we should infer, that either wax is used in the plant to produce sugar, or sugar to form wax. That this is a very important point he makes evident by the following experiments of Gundisch. He fed bees with a solution of sugar-candy in water, and saw them producing wax. Thus the sugar-cane and bees are both enabled to convert sugar into wax, that is, into a fatty matter.

There are some animals, just as there are some plants, which contain peculiar fats; there are even separate organs in which certain fats are formed.

In order to find the following acids, chiefly in combination with the cavity of the skull of the Physother macrocephalus; phcenine, in the fat of Delphinas phoca; cholasterin, in amber; and the haem of known as alacron-fats known as album; cerebro, cephalol, and steacozoacet—are illustrations of this class.

It is worthy of observation, that both in the vegetable and the animal kingdom there seems a connection between the protein-compounds and fat: when we find solid protein-compounds deposited in plants, we often find at the same time a large quantity of fat, as in numerous seeds; the brain and milk serve as illustrations of the same point in the animal kingdom.

The next question for our consideration is the formation of fat—a subject which has given rise to much angry and intemperate discussion between the leading chemists of France and Germany. Dumas, who was regarded as the representative of the French school, maintains that all the fat of animals originates in and is obtained from plants; while Liebig, on the contrary, maintains that a portion of it is formed by the animal itself, from starch, sugar, and gum. The goose was the animal respecting which the dispute originated. When fattened with Indian corn, the starch must, according to Liebig, have been changed into fat, because he had found but a minute quantity (about 1 part in 600) of fat in that kind of grain. Dumas, however, extracted 9 percent fat from Indian corn (or ninety times as much as Liebig), and thus he found in the food which the goose had eaten much more fat than was present in the fat of the animal itself. For Liebig himself admits that the amount of fat in this grain is so variable that no conclusion can be drawn from the experiment. Liebig quotes many examples of substances which, although they contain little fat, are well known by experience to be especially fit for fattening the animal body. Rice, peas, beans, and potatoes all contain much starch; yet rice gives only 0% to 0.1% of fat, of the peas 0.5% to 0.6% of fat, and of potatoes 5% to 6% of fat. Any animal that has eaten 1000 pounds of one of these substances may obtain from it 2 to 3, 12 to 21, 7, or 8% pounds of fat respectively. He makes the following calculations:

Three pigs were fattened in thirteen weeks require 1000 pounds of peas, and 6525 pounds of boiled potatoes, the latter being equal to 1630 pounds of dry potatoes. These contain in all 26 pounds of fat, the peas yielding 21, and the potatoes 5 pounds. One fattened pig gives on an average 50 to 55 pounds of fat, the three yielding 150 to 165 pounds. Each pig before fattening contains on an average 15 pounds of fat—i.e., 54 pounds for the three. If to these 54 pounds be added 26 pounds contained in the food, we get 80 pounds; and if we subtract these from 150 to 165 pounds, there is a remainder of 70 to 115 pounds, or 35% to 40% of the fat, of the food. Liebig's opinion is further strengthened by the circumstance that some fats are undoubtedly produced in the body, as, for instance, the fats peculiar to the brain, cholestearin, cetine, phcenae, &c. To obtain these from other fat requires just as much new arrangement as if they were produced from starch; hence, in a scientific point of view, there is nothing improbable in the supposition that animals are able to produce fats.

With regard to the presence of fat in plants, it is worthy of observation that all seeds which yield oil on pressure—as the castor-oil seed, hemp seed, &c.—contain starch in their early stages, this starch disappearing as the oil increases, and when the seed is completely developed is not trace of the starch remaining. This renders it probable that these fatty matters are formed from starch. From their ultimate composition it is obvious that whenever fats are produced from any substances that are subject to the action of high-oxidised compounds, or else that oxygen must be itself liberated. Liebig observes that if from the formula for starch, C₆H₁₂O₆, we take 9 equivalents of oxygen, there will remain in 100 parts

\[ \text{C₆H₁₂O₆} \rightarrow 9 \text{O}_2 \]

The empirical formula for fat which comes nearest to this is C₃₀H₄₆O₆, which gives in 100 parts—

\[ \text{C₃₀H₄₆O₆} \rightarrow 36 \text{O}_2 \]

According to this formula an equivalent of starch, in order to be converted into fat, would lose one equivalent of carbonic acid and seven equivalents of oxygen (expressed in symbols)

\[ \text{C₆H₁₂O₆} \rightarrow \text{C₆H₁₀O₆} + 7 \text{O}_2 \]

The same point is also clearly shown by contrasting the ultimate composition of starch and fat.

To 7 equiv. of starch 84 70 70
Add 8 equiv. of water 8 8
And we have 84 78 78

Which are equal to
1 equiv. of marag acid 34 34 3
1 equiv. of oleic acid 44 44 4
2 equiv. of oxide of lypil 6 6 2
69 equiv. of oxygen 69

Making as before 84 78 78

There is a substance almost universally diffused through plants, which we must here notice, and that is, the green colouring matter or chlorophyll. For the following account of this substance we are almost entirely indebted to the investigations of Mulder. It is a striking fact that young leaves have a much lighter green colour than those which are older, showing that the quantity of chlorophyll increases with the age of the leaves. If chlorophyll were a substance poor in oxygen, and were derived from substances rich in oxygen, this fact alone would be sufficient to explain the matter which the green parts possess of separating oxygen. This however is not the case; chlorophyll is rich in oxygen. Nevertheless the leaves give off oxygen not because they are green, but whilst they are becoming green.

When green leaves are digested with ether the liquid becomes green. On evaporating the ethereal solution, and treating the residue with hot alcohol, a considerable amount of white fatty matter (wax) separates on cooling, while the green colouring matter remains in solution. Before proceeding to the consideration of the green colouring matter, it will be expedient to say a few words respecting the mixture it forms with the wax.

In a physiological or botanical sense this mixture has the name of chlorophyll; in a chemical sense the term is restricted to the active green matter. To prevent confusion the former is designated as B. chlorophyll; the latter by C. chlorophyll; B, indicating the botanical, and C, the chemical signification of the word.
We find similar mixtures of a waxy fat, and colouring matter, in other external parts besides the leaves, namely in the petals of the flowers, in the sepals, and in the calyx; and when digesting them in ether we obtain a large quantity of waxy matter in solution, varying in tint according to the colour of the skin; being grey when obtained from apples, and of a brownish or orange colour when obtained from the berries of the mountain ash.

The degree in which the action of light contributes to the change of colour in the C. chlorophyll which exists in the pericarp of tomatoes and the production from it of the colouring matter of the skin of ripe fruits may be obviously inferred from the green colour which such fruits retain if they do not receive a sufficient supply of solar light, or from the difference of colour produced by the opposite side of the same fruit, as well as from the fact that leaves when deprived of the action of light become colourless, while if completely exposed to its action they become a considerable amount of B. chlorophyll.

This apparently anomalous difference in the action of light on the skins of fruits and on leaves is dependent on the same cause as the change of colour in the leaves during autumn; namely, that light not only produces B. chlorophyll when there is a sufficient supply of materials for its renewed formation as often as the existing quantity is decomposed by the influence of the light; and that as soon as this supply is exhausted the green colouring matter is itself decomposed, and other compounds are formed from it.

Light acts powerfully in keeping plants green, and likewise exerts a powerful decomposing action upon all colouring matter, whether chlorophyll be present or not, thus, as we have seen, potatoes, young leaves, &c., become green whenever they are exposed to light, and hence there must be a substance widely diffused through plants, which causes the production of chlorophyll, and which takes place not merely on the surface, but to this extent, as far as it can penetrate through the translucent parts. A full explanation of this phenomenon must be considered part of the action of light, and it is known that the absorbed light is not the only factor involved in the process. Hence, while we may conclude that in these plants or parts of plants, the materials yielding chlorophyll are absent. We may sometimes observe, in sunlight, one single spot of a green leaf, colored red by the action of insects, or by being injured by hail; the green colouring matter is at the spot decomposed by the light; no new portion is formed, and the spot acquires the same colour which the whole leaf would have assumed in autumn. From this we infer that the change of colour in the leaves during autumn is simply dependent on a chemical alteration of the green colouring matter by light.

Mulder, after showing from a large number of facts that wax along with a green colouring matter exists in leaves and unripe fruits,—wax with a red colouring matter, in the red leaves which appear in autumn, and in the red fruits,—and wax with a yellow colouring matter, in the yellow leaves of autumn, and in the yellow fruits, gives a lengthened chemical description of chlorophyll, for an account of which we must refer to the original work.

In another's experiments, and those previously instituted by Berzelius, it appears that the green colouring matter of the leaves is readily decomposed into three different substances, one yellow, another blue, and a third black; and that according to the proportion of these three mixed with the green, a different kind of green must be produced. Hence the difference in the green colour of different leaves depends not only on the presence of more or less chlorophyll, but also on the different mutual proportions of these three colouring matters.

The quantity of pure C. chlorophyll contained in the leaves is exceedingly small; according to Berzelius, it is not more than the amount of pigment in dry cotton.

If pure chlorophyll is added to the action of the sun, the green color becomes in a few hours converted into a yellow. When a solution of pure chlorophyll in ether and hydrochloric acid was kept for five months in a bottle half full, the entire chlorophyll was changed into yellow. From this experiment we learn, first, that the green colouring matter is decomposed and a yellow one left, both with and independently of the influence of light; and secondly, that all probable similar decomposition (accompanied by a reproduction) of green colouring matter and green leaves is constantly going on under the influence of light. Mulder concludes that the colour of decomposed green chlorophyll is not essentially in part the origin of the wax, since the quantity of the latter is found to have increased when the same leaves are analyzed later in summer. In consequence of the continuance of this reproduction the leaves remain green; when it stops, the leaves become yellow, as in autumn.

It is generally supposed that chlorophyll yields a blue colouring matter; it is this which is no doubt present in the skins of many fruits, as for instance those of the grape; the exact nature of the chemical change is not clearly understood.

It is very obvious that the influence of light will convert starch into chlorophyll. Every part of an amylaceous root becomes green on exposure to light. The parts of plants which become green (without exception) contain starch; and in autumn as this green colour decreases, the starch also decreases, and finally cannot be detected by the iodine-test. Hence the greenness of leaves is the same, whether the influence of light; the B. chlorophyll being a complex substance consisting chiefly of wax. The change of starch into botanical chlorophyll may be explained in much the same manner as its conversion into fat.

The wax contained in the leaves and other parts of plants may be chemically represented by the formula C_{54}H_{10}O_{8}. Now if no other products are simultaneously produced we may suppose the wax obtained from the starch in the following manner:

\[\text{5 equiv. of starch} \rightarrow C_{54}H_{10}O_{8} \text{ With 10 of water} \rightarrow C_{54}H_{10}O_{8}\]

Make \[\text{C}_{54}H_{10}O_{8}\]

And 4 of wax \[\text{C}_{54}H_{10}O_{8}\]

Leaving to be given off \[O_{8}\]

That is to say, 5 equivalents of starch yield 4 equivalents of wax, and give off 66 equivalents of oxygen. This fully explains the phenomenon why plants while becoming green, evolve oxygen, and further indicates the use of starch in the leaves.

Mulder has, as far as we are aware, made only one ultimate analysis of pure C. chlorophyll—that from poplar leaves; from this analysis he calculated the formula C_{49}H_{9}N_{O}. Properly speaking, 'Mulder observes,' the green colouring matter in the leaves has nothing to do with the evolution of oxygen; on the contrary, the colourless C. chlorophyll, which seems to be everywhere present, becomes green by the absorption of oxygen. Hence a small portion of the oxygen produced from the conversion of starch into wax is employed for this purpose, and is not mixed with the atmosphere. But this is just the reason why C. chlorophyll is not formed by the exhalation of oxygen; it only becomes green instead of white, as it previously was. This can only happen when there is an abundance of oxygen, and it has been seen to be the case when starch is converted into wax. We may therefore assume as proved that white chlorophyll diffused throughout the whole plant, will become green in proportion as starch is converted into wax, with a corresponding reproduction, to take up oxygen—to become oxidised, just like white indigo.

Now, the probable composition of green chlorophyll, C_{49}H_{9}N_{O} shows that pure white chlorophyll is not produced in the plant. It is necessary, then, if we assume that in a liquid state, should penetrate into the globule of starch, which during this transformation into wax is converted into C_{54}H_{10}O_{8}. We do not know yet what that substance is, but it is certain that it must be one which is diffused throughout the plant like starch; hence it is probably protein, which is changed into a most beautiful violet-coloured substance by the influence of hydrochloric acid and oxygen.

We now return to the animal kingdom, and have a few remarks to offer on gelatin, a substance yielded by most parts of the animal body. Amongst the component parts of organized bodies, the most frequent is the cell. Modified in an infinite variety of forms, it gives rise to the innumerable varieties exhibited both by plants and animals, in the external form, the structure, and consequently the functions of their organs. In the vegetable kingdom the substance employed in the construction of these cells is cellulose combined with a little protein. In the animal kingdom the case is very similar, although the elementary form of the tissue and its chemical characters are different. In animals we must distinguish between the persistent and the original cellular substances. The original in all probability varies in different cases, while the persistent exhibits a constant and general character. The persistent is consequently a secondary product, and in this respect differs from the cellular substance in plants which is a primary or original one; neither has it an actual cellular form like the latter. There is however a resemblance be-
between the two in several points, especially in relation to the large proportions in which they both exist, and to the several functions which they perform. Gelatin is more or less widely diffused over the body, and it would exhibit the entire shape of the principal organs, even if all other constituents were separated. It constitutes the skin, the membranous covering of the mucous membranes, and the spongy portion of bone, and many other substances. It is insoluble in cold water; acetic acid renders it transparent and bulky; and in boiling water, and when hydrolyzed, it acquires the last property that it has received the name of gelatin. The gelatinous substance (skin, vascular tissue, serous membranes, &c.), is insoluble in cold water, and on boiling is merely physiologically changed, although its properties, according to our present means, are nothing taken up and nothing separated; the alteration being similar to that undergone by starch when heated in water.

The composition of gelatin is represented by the formula 4 \( C_2 H_2 N_3 O_4 \) or \( 4 \). Whether obtained from cartilage, from isinglass, or from silk. Both boiled and unboiled cellular tissue (after its conversion into glue) combine with tannic acid, and produce compounds which are insoluble in water and resist precipitation; hence the power of all medicines containing this substance to heighten the tone of the system. The protein-compounds in a similar manner form hard and coherent compounds with tannic acid. For this reason, and for the frequent observation that the above-mentioned other astringent medicines produce compounds of this nature in the organism.

Boiling gelatin water for a long time we obtain a mixture, which is no longer gelatinous; its composition is 4 \( (C_2 H_2 N_3 O_4) + 8 \) or 32. This peculiarity should be remembered, for the compound is likely to be formed in the preparation of broth, and in the preparation of Papin's Digestor to be looked for; and it is regarded by Mäder as doubtful whether this hydrated gelatin can be again converted in the organism into nutritious matter, and whether it may not produce noxious substances in the body.

As gelatin has never yet been discovered in the vegetable kingdom, there is every reason to believe that it is produced in the animal body. It is most probably formed from the decomposition of the protein in the blood, through the action of the alkali in the serum, and the oxidizing influence of the atmosphere.

We are likewise imperfectly acquainted with the products of the decomposition of the gelatinous tissues in the body. Out of the body we know that by the influence of oxidation on gelatin prussic acid is formed, and that, by the action of alkalis, gelatin-sugar, lecose, and extractive matters are produced, while ammonia is disengaged, and an alkaline carbonate formed. Finally, when boiled in dilute sulphuric acid it yields extractive matters with either gelatin-sugar or lecose. Since lecose is also produced from albumen when decomposed by heat, we possess an intimate connexion between that protein-compound and gelatinous matters.

Besides the gelatin obtained from cellular tissue and serous membranes there is another kind which has many of its properties different from the former. It was first described by Müller under the name of chondrin. It is obtained from the cornea, and from those cartilages which do not ossify, by boiling them in water.

The preceding observations on the general organic substances which exist in the two great departments of the organic kingdom are sufficient for the clear understanding of the forms and properties of the elementary parts of plants and animals. Both kingdoms however contain an immense number of additional substances. In plants there are acids, bases, coloring matters, oils, and resins; in animals there are the various secretions. As these vegetable products have been fully treated of in many of the articles of the *Penny Cyclopaedia*, our attention will in the future part of this article be chiefly confined to the animal products.

It is generally admitted that after gelatin has been dissolved, albumen contains about 8 per cent., and gelatin containing 4 per cent. of sulphur. This is very nearly the amount of sulphur which forms for chondrin given in the text, and which is deduced by Mäder from his own analyses.

* Likely has recently found that albumen, fibrin, and casein contain more sulphur, about 20 per cent., when boiled and casein contains 4 per cent. of sulphur. This is very nearly the amount of sulphur in the formula for chondrin given in the text, and which is deduced by Mäder from his own analyses.

**Section II.** Microscopic Character of Tissues.

All organic beings, according to the cell-theory, are composed of a number of minute parts, which in their leading characteristics are identical in the two kingdoms, but which are variable, and whose organic composition is distinctly not only in the animal and vegetable world, but likewise in the different organs of the same animal or plant. These minute parts, which are invisible to the naked eye, although they are found in the vegetable kingdom, are only visible through the microscope in the vegetable, and are known by the term cell. The animal kingdom is more abundant in these minute organisms, which have the most curious combinations and functions. All the tissues that we meet with both in the animal and vegetable world are nothing more than groups of these elementary parts; their functions depending on the nature of the grouping.

The elementary forms which organic matter on becoming organized assumes, are for the most part, if not always, minute vessels which can only be distinguished by the microscope. These have received the names of cellulectomes, or primary cells. They are most easily observed in vegetable and animal tissues in the process of development. They usually contain a fluid, but granules are also set up, and develop in every part of the body, which gives the organism wherein a nucleus is often observable. This nucleus is almost invariably present in animal cells, whilst it can only be distinguished in the young cells of plants. From these simple cells, slight modifications of the elementary forms are constructed; we find them in the blood (blood-corpuscles), in the lymph, in mucous and pus, and in every solid part of the animal body.

The cell-theory in relation to the vegetable kingdom has been already noticed in the article Tissue, Vegetable, F. C., our observations will be entirely confined to the cellular formation and structure of the animal world.

On the addition of acetic acid the cell-wall dissolves while the nucleus remains unacted on; hence the nucleus is regarded as a distinct body. It is named by Schleiden the cytoblast (source, a cell, and βλάστειν, I cause to bud), being supposed by that physiologist to be the originator of the cell. In the nucleus we can usually observe one or more dark spots which have received the name of nucleoli. The nature of these nucleoli is unknown; we cannot tell whether they are cavities, vesicles, or solid particles. They lie on the inner part of the nucleus.

The nucleus itself is regarded as a minute cell; it is connected with the cell, and is an essential element of it.

The cells are surrounded by a fluid whose consistency increases with the age of the tissue, and which finally becomes solid, forming intercellular substances. The cell-tissue takes places in the following manner. In an amorphous, semifluid, sometimes almost gelatinous mass which is named the cytoblastema, and wherein the substances necessary for cell-formation are contained, there is a rapid formation of minute rounded granules (nucleoli), around which is deposited a layer of granular matter, which gradually becomes thicker and forms the nucleus. On the surface of this nucleus a vesicle arises, resembling a segment of a sphere. This vesicle is thin and transparent, at first smaller than the nucleus, but rapidly enlarges, and when it has attained its full size, the nucleus is seen as a minute body attached to its inner wall. The substance necessary for the formation of the vesicle is yielded by the cytoblastema. The earliest trace of organization is coincident with the appearance of the nucleus, which gives rise to the formation of a deposit of granular matter around it, and in this way to the production of the cell.

This theory of cell-formation, which is supported by Schleiden and Schwann, proceeds on the assumption that in cells there is always a pre-existing nucleus. It is objected to by Henle and others, on the ground that there are cells in the vegetable kingdom in which there is no nucleus, or in whose nuclei there are no nucleoli; as for instance in the cryptogamia; and according to Meyen also in many phanerogamia. Similar objections have been made to cell-theory in the animal kingdom, but Schwann combats the objection by the assertion that the nucleus or nucleoli become absorbed during the development of the cell.

According to Schleiden, the membrane of the cell grows from the nucleus, which latter remains as a persistent part of
the cell-wall; Mohl opposes this view, asserting that the nucleus lies within the cell at some distance from its mem-
brane. Fig. 1.

An ideal figure illustrating the formation of a cell. In an amorphous substance (A A), the protoplasts lie, three ideal cells (B, C, D). The cell B appears as a hollow and in the cavity of the cell, a fluid which escapes observation. The cell C is round; it contains a nucleus with a single nucleus in its centre; the cavity is filled with dark granular matter. In the cell D the nucleus lies on the inner surface of the cell-wall; no nucleus is observable. The latter form is very rare in the vicinity of the nucleus, but fluid and invariable in the remainder of the cavity.

Valentin has also made similar observations in many of the animal tissues. He has observed cases in which the nucleus was not directly connected with the cell-wall, except by a few radiating fibres. Hence the function of the nucleus in relation to cell-formation is still obscure.

Whenever cells are formed, numerous pro-existing nuclei are always present. They serve to form the contents of the cell, while the cell-wall is probably formed from the delicate connecting medium which unites these minute granules. These granules, which are the most minute organised particles with which we are acquainted, must be regarded as the most elementary form of all organic structures, since they are a necessary condition for cell-formation; there can be no doubt that they contain a protein-compound, since in the most recent structures in the animal and vegetable world protein is never absent, and indeed appears to be essential to organization.

The very simplest form of fungi (such as the common mould-plant) which is produced in non-nitrogenous bodies, such as lactic or tannic acid under the influence of the atmosphere (and therefore of nitrogen) and of water, contain protein from the first moment of their existence or of their mother. The bodies of the primary and germinal membranes.

This structure receives the former name from its being the foundation or resting-place for the epithelium-cells which cover its free surface, whilst the latter appellation was selected because it is a form of the primary cells of glands, and the source of secondary or secreting-cells. Bowman considers it to be simple or homogeneous. This is true as far as it contains no blood-vessels, and as regards its external and attached layers; but as in its original condition it consists of cells, and when perfect contains nuclei at equal or variable distances, it must not be considered as simply molecular.

Germinal membranes, observes Goodier, are only met with on the free surface of parts or organs. One surface of the membrane is therefore attached, and is applied upon a layer of areolar texture, interspersed with a more or less rich net-work of capillary vessels; while the other surface is free, and it is only on it that the developed or secondary cells of its germinal spots are attached. These secondary cells are at first contained between the two layers of the membrane, these layers being the opposite walls of each of its component cells. When fully developed, the secondary cells carry forward the anterior layer which is always the thinnest, leaving the nuclei or germinal centres in the substance of the posterior layer, in close contact with the blood-vessels. To show the peculiarities of the primary membrane, it may be observed that it constitutes the outer layer of the true skin; it lines all the cavities formed by mucous membranes, and is prolonged into all the ducts, and ultimate follicles and tubuli of the glands connected with them; it likewise forms the innermost layer of the serous and synovial membranes, and lines the blood-vessels and lymphatics, forming the sole constituent of the walls of their minute divisions. The primary membrane must be regarded as a trentalent structure; furnishing the germ of all the cells which are developed on its surface, as well as the nutritive which they require for their support, its free surface must be continuous undergoing disintegration, and must be as regularly renewed at the side in connexion with the blood-vessels. Fig. 2.

We now proceed to notice the history and functions of isolated animal cells. It is only during the last three or four years that any correct ideas have been maintained regarding the importance of simple isolated cells in the animal economy; each of these cells grows and lives independently of the others, deriving its support from the general nutrient fluid of the part in which it exists.

The animal cell in its simplest form originates from a reproductive granule, previously formed by some other cell; this granule attracts to itself, and assimilates and organizes the particles of nutrient fluid in its neighbourhood, converts some of them into the substance of the cell-wall, whilst it draws others into the cavity of the cell; in this manner the cell gradually increases in size, and whilst it is itself approaching the term of its life, it usually makes preparation for its renewal by the development of reproductive granules in its interior, which may become the germ of new cells when set free from the cavity of the parent. This mode of production and growth is almost identical with that occurring in the vegetable cell; there is however an important difference in their power of producing new active compounds from inorganic matters; whilst the former has no productive power of this nature, but can merely transform one set of compounds into other, so that the formations of simple isolated animal cells are afforded by the corpuscles of blood, lymph, and chyle. There is a certain uniformity in their general character. They are only found in albuminous fluids, and they do not vary very much in size, averaging about the 8000th of an inch in diameter. They are known as lymph or chyle corpuscles, or as the white corpuscles of the blood. These white corpuscles have only of late years attracted much attention, though they had been described as far back as the time of Hewson. In man and the mammalia they are often larger than the red corpuscles; they may be recognised by their granular appearance, their peculiar contour, and their regular shading of their figure. (Fig. 3, parts 4 and 5.) They are also to be distinguished from the red corpuscles by their different actions towards chemical re-agents; they are not attacked by water, but remain in it for a long time without apparent change; they are not rendered transparent, and dissolved by acetic acid; they only become more decidedly granular under its action, and a kind of nucleus is developed in their centre. As they are in all respects similar to those of lymph and chyle, and as they contain the same chemical relations, they have been regarded by many as the corpuscles of the lymph mingled with the blood, and have hence been termed lymph corpuscles (Hewson, Müller); others have yet considered them as glories of the minute blood-corpuscles (Webber); and others again as blood-corpuscles in progress of solution or disintegration. They may be seen in the capillary system of living animals (in transparent structures, as for instance in the frog's foot) swimming with the ordinary blood-corpuscles, but not so much moving rapidly in the great cur.
rent of the blood, as progressing in close contact with the walls of the vessels. They are soft and elastic, like the ordinary corporulae, and seem to stick to each other. The exact functions of these corporulae are still unknown, but there are many facts which seem to indicate that there is a decided relation between them and between the nutritive or organic life of the tissues.

**Fig. 3.**

1. Red corporulae of human blood, exhibiting their flattened surfaces
2. Red corporulae of frog's blood
3. Corporulae of horse's blood
4. Red corporulae of reindeer's blood
5. The same, enlarged by the illumination of a microscope.

On examining a drop of blood under the microscope, we find, in addition to these cells, which are comparatively rare, an immense number of what are termed red corporulae, but which usually present a yellow appearance. These red corporulae have been already noticed in the article Blood, P. C. C. The following are the most important additions made to our knowledge of them since the publication of that article. The blood of numerous animals has been submitted to microscopic examination by Nasse, Wagner, Gulliver, and other observers. In the article Blood it is stated that the red particles of the blood have a circular form in all animals constituting the class mammalia. A remarkable exception to this rule has been shown by Mann to occur in the corporulae of the camel tribe. The mean long diameter of the blood-corporulae of the dromedary is found to be the 226th of an inch, while the mean short diameter was only the 561st of the same standard. In the paco (Auchenia paco) and gusnaco (Auchenia glama) the blood-corporulae scarcely differed in form and size from those of other mammalia, whilst those of the Napa musk-deer were more than half the size of the smallest that have been observed in birds or reptiles.

The difference of size in the corporulae of different mammalia is also worthy of notice. The average diameter of the human of man, according to Mr. Gulliver, is the 339th of a inch, but the average diameter of those of the elephant, according to the same observer, is as much as the 274th of an inch (which were the largest he observed amongst the mammals), whilst those of the Napa musk-deer were more than the 12,525th, and some were as small as the 60,000th of an inch in diameter. There is also an exception to the general statement that the corpuscles of fishes are oval; in one class, namely the Cyecloptomi, or lamprey tribe, they are circular. Neither is the statement now correct that the corpuscles of the skate are the largest known; those of certain reptiles, as for instance the iguana and the crocodile, are considerably larger, and are even visible to the naked eye as very minute specks.

There can be no doubt that the red corpuscles go through the same course as other cells. We have undoubted evidence of their rapid regeneration in cases where much blood has been lost, and of the peculiar power which chalybate medicines have in forwarding their production. The precise method in which they are developed is however not exactly known.

With respect to the chemical composition of the blood-corporulae, we have already stated that the globulin of which the walls are formed seems undoubtedly to be a protein compound. The same is the case with the pigment which received the name of haematin, and is contained in the vesicles of globulin. It has been generally assumed that this substance exists in two distinct states in arterial and venous blood, leaving in the former and excesses of oxygen; and an excess of carbon or carbonic acid. Muller has however shown that its elementary composition is the same whether obtained from arterial or venous blood, and that it may be represented by the formula O₂₂ N₂₂. It is, however, certain that venous blood contains a compound of iron, and no other constituent of the body contains iron. Whatever change the other constituents of the blood undergo in the lungs, this metal is certain, that the globules of venous blood experience a change discolouration, and that this change depends on the action of oxygen. Now we observe that the globules of arterial blood retain their colour in the larger vessels, and lose it only during the passage through the capillaries. All those constituents of venous blood which are capable of combining with oxygen, take up a corresponding quantity of it in the lungs. Experiments made with arterial serum have shown, that when in contact with oxygen it does not diminish the volume of that gas. Venous blood in contact with oxygen is reddened, while oxygen is absorbed, and a corresponding quantity of carbonic acid is formed. It is evident that the change of colour in the venous globules depends on the combination of some one of these elements with oxygen; and that this absorption of oxygen is attended with the separation of a certain quantity of carbonic acid gas. This carbonic acid is decomposed from plasma by the acid of the serum does not possess the property, when in contact with oxygen, of giving off carbonic acid. On the contrary, when separated from the globules, it absorbs from half its volume of oxygen, and becomes equal volume of carbonic gas; and this free carbonic acid is not saturated with that gas. Arterial blood, when drawn from the body, is soon altered; its florid colour becomes dark red. The florid blood, which owes its colour to the globules, becomes dark by the action of carbonic acid, and this change of colour affects the globules, for florid blood absorbs a number of gases which do not dissolve in the fluid part of the blood when separated from the globules. It is evident therefore that the globules have the power of combining with carbonic acid. The globules of the blood change their colour in different gases; and this change may be owing either to a combination or to a decomposition. Sulphured hydrogen turns them blackish green and finally black; and the carbonic acid cannot be restored in this case, be restored by contact with oxygen. Here a decomposition has obviously taken place. The globules darkened by carbonic acid become again florid in oxygen, with the decomposition of carbonic acid. The same thing takes place in nitrous oxide. It is clear that they have undergone no decomposition, and consequently they possess the power of combining with gases, and the carbonic acid of the plasma, as in this case, be restored by contact with oxygen. Here a decomposition has obviously taken place. The globules darkened by carbonic acid become again florid in oxygen, with the decomposition of carbonic acid. The same thing takes place in nitrous oxide. It is clear that they have undergone no decomposition, and consequently they possess the power of combining with gases, and the carbonic acid of the plasma, as in this case, be restored by contact with oxygen. Here a decomposition has obviously taken place. The globules darkened by carbonic acid become again florid in oxygen, with the decomposition of carbonic acid. The same thing takes place in nitrous oxide. It is clear that they have undergone no decomposition, and consequently they possess the power of combining with gases, and the carbonic acid of the plasma, as in this case, be restored by contact with oxygen. Here a decomposition has obviously taken place.
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TIS the globules take no share in the process of nutrition, it cannot be doubted that they play a part in the process of respiration. The compound of iron in the globules has the character of an oxidized compound; for it is decomposed by sulphuretted hydrogen, exactly in the same way as the oxides or other analogous compounds of iron. By means of diluted mineral acids, peroxide (sesqui-oxide) of iron may be extracted, at the ordinary temperature, from the fresh or dried red colouring matter of the blood. The characters of the compound of iron are such as to make it a part of the respiratory process. No other metal can be compared with iron for the remarkable properties of its compounds. The compounds of protoproteic acid possess the peculiar properties of the other oxidized compounds of iron; while the compounds of peroxide of iron, under other circumstances, give us oxygen with the utmost facility. Hydrated peroxide of iron, in contact with organic matters destitute of sulphur, is converted into carbones of the protoproteic acid. Carbonate of protoproteic acid, in contact with water and oxygen, is decomposed; all the carbonic acid is given off, and by absorption of carbonic acid it passes into the hydrated peroxide, which may again be converted into a compound of the protoproteic acid. Not only the oxides of iron, but also the cyanides of that metal, exhibit similar properties. Prussian blue contains iron in combination with all the organic matters of the body. The iron is in combination with both hydrocarbons and oxygen (water), carbon and nitrogen (cyanogen). When it is exposed to light, cyanogen is given off, and it becomes white; in the dark it attracts oxygen, and recovers its bluish color. The characters that the one exhibits when it is exposed to light, and the other when it is exposed to darkness, agree with our opinion that the globules of arterial blood contain a compound of iron saturated with oxygen, which in the living blood loses its oxygen during its passage through the capillaries. When the temperature is raised, it is converted into the white state, and begins to undergo decomposition. The compound, rich in oxygen, passes therefore, by the loss of oxygen, into one far less charged with that element. One of the products of oxidation formed in this process is carbonic acid. The compound of iron in the venous blood possesses the property of combining with carbonic acid; and it is obvious that the globules of the arterial blood, after losing a part of their oxygen, were involved in the reaction with carbonic acid, and obtained what we call the pneumonia. When they reach the lungs, they will again take up the oxygen they have lost; for every volume of oxygen absorbed, a corresponding volume of carbonic acid will be separated; they will return to their former state, that is, they will again acquire the power of giving off oxygen. For every volume of oxygen which the globules can give off, there will be formed (as carbonate contains its own volume of oxygen without condensation) neither more nor less than an equal volume of carbonic acid. For every volume of oxygen which the globules are capable of absorbing, no more carbonic acid can possibly be separated than that volume of oxygen can generate. When the degree of oxidation is the same, the amount of oxygen passes into the hydrated peroxide, there are given off, for every volume of oxygen necessary to the change from protoproteic iron to the oxidized, four volumes of carbonic acid gas. But from the one volume of oxygen, and only one volume of carbonic acid gas can be produced. And the absorption of one volume of oxygen can only cause directly the separation of an equal volume of carbonic acid; consequently the substance or compound which has lost its oxygen during the passage of arterial into venous blood, must have been capable of absorbing or combining with carbonic acid; and we find, in point of fact, that the living blood is never, in any state, saturated with carbonic acid; that it is capable of taking up an additional quantity without any apparent disturbance of the functions of the globules. Thus, for instance, after drinking effervescing wines, beer, or mineral waters, more carbonic acid must necessarily be expired than at other times. In all cases where the oxygen of the arterial globules has been partly extended otherwise than in the formation of carbonic acid, the amount of this latter gas will be proportionate exactly to that which has been formed; less however will be given out after the use of fat and of still-wines than after champagne. According to the views now developed, the globules of arterial blood in the fresh or dried state, as well as in the fluid under the capillaries, and in the living body, are continually oxygenating the constituents of the body. A small portion of this oxygen serves to produce the change of matter, and determines the separation of living parts, and their conversion into lifeless corpuscles, which are the final products of the formation of the body. The greater part, however, of the oxygen is employed in converting into oxidized compounds the newly-formed substances which no longer form part of the living tissue. In their return towards the heart, the globules which have lost their oxygen combine with carbonic acid, producing venous blood; and when they reach the lungs, an exchange takes place between this carbonic acid and the oxygen of the atmosphere. The organic compound of iron, which exists in venous blood, is converted in the lungs the oxygen it has lost, and in consequence of this absorption of oxygen the carbonic acid in combination with it is separated.

Mulder is strongly opposed to this theory; he denies that the iron takes any share in the respiratory process; and he refers the process entirely to the oxidation of the protein-compounds. He alleges the following grounds against the probability of the correctness of Liebig's views on this subject.

1. The iron is intimately connected with the other elements of hematin, that it cannot be removed even by long digestion of this constituent in dilute hydrochloric or sulphuric acid. If these re-agents cannot effect its oxidation, it is highly improbable that it should be oxidized in the lungs.

2. If, as Liebig asserts, peroxide of iron exists in arterial blood, the oxygen of this would be capable of removing any dilute acid would be capable of removing it. But this is not the case. Hematin, properly prepared, may be digested with dilute hydrochloric or sulphuric acid for many days without any perceptible change; but, if the hematin is not treated in this manner Mulder obtained by combustion 9·49 per cent. of peroxide of iron, which is the constant quantity always left after the combustion of well-prepared hematin.

3. The probability that the iron exists in a metallic state is strongly supported by the observation that hydrogen is evolved when a clot of blood is digested in sulphuric acid, and water is not absorbed. Mulder suggests that it occurs as an integral constituent of hematin in just the same manner that iodine occurs in sponge, sulphur in cynsin, or arsenic in the cacodyl series.

4. The fact of hematin in the whole mass of the blood is far too inconsiderable to carry a due supply of oxygen to the whole system.

Having thus shown the principal objections to which Liebig's celebrated theory is open, we shall endeavour briefly to explain the rival theory of Mulder. We have at an early part of this article shown that the protein-compounds are capable of undergoing oxidation when in contact with the oxygen of the air. When a protein-compound becomes oxidized, it assumes a plastic character, that is to say, it has a tendency to become solid and to adhere to solid substances. Now we have already mentioned that the blood-corpuscles are principally composed of a protein, the phosphoglycin, or globulin. When a respiration is performed, the exterior layer of such of the corpuscles as are exposed in the lungs to the action of the oxygen of the air is converted into a white layer, or globulin; it becomes whitish and less transparent. This is the same as in the blood-corpuscles of the capillary system, where the whole external layer is employed in the change of material of the body, and is in that way consumed. Having lost this white layer, they again become transparent. The dark-colouring substance in the corpuscles of arterial blood, shining through a white layer, must necessarily appear of a bright red tint, as may be shown by pouring dark red blood into a vessel of milky glass.

The preceding observations have been made with the view of showing the utility of these isolated animal cells—the blood-corpuscles—and their reproductive process. We shall revert again to the distinctions between the characters of venous and arterial corpuscles in our remarks on the colour of the blood.

In our remarks on various tissues we shall often again have occasion to notice these peculiarities. We shall give another illustration of their utility, namely, their importance in the process of nutrition. Mr. Goodall has recently shown that there is a continual development of cells at the extremity of each reagent, and that the agents by which the secretion of the nutritive fluid is accomplished, and by which it undergoes its first preparation for the purposes it is subsequently to fulfil. The process takes place as follows: the reagents enter into contact with the blood-corpuscles, and the observations in his own words, omitting those portions which do not bear specially on the point.

As the chyle begins to pass along the small intestine,
increased quantity of blood circulates in the capillaries of the gut. In consequence of this increased flow of blood, or from some other cause, the pigments are distributed, the internal surface of the gut throws off its epithelium, which is intermixed with the chyme in the cavity of the gut. The cast-off epithelium is of two kinds,—that which covers the villi, and that which is on the mesentery. Each of these forms, may be termed a protective epithelium; and that which lines the follicles, and is endowed with secreting functions. The same action then, which in removing the protective epithelia from the villi prepares the matter for the function of absorption, throws out the secreting epithelia from the follicles, and thus conduces towards the performance of the function of these follicles. This villi, being now devoid of blood, erected, and naked, are covered or coated by the white-grey matter already described. This matter consists of chyme, of cast-off epithelia of the villi, and of the secreting epithelia of the follicles. The function of the villi now commences. The minute vessels which are interspersed among the terminal loops of the lacteals of the villus, increase in size by drawing materials from the blood through the coats of the capillary vessels, which ramify at this spot in great abundance. While this increase in their capacity is in progress, the growing vesicles are continually exerting their absorbing function, and draw into their cavities that portion of the chyme in the gut necessary to supply materials for the chyle. When the vessels respectively attain in succession their specific size, they burst or dissolve, their contents being cast into the texture of the villus, as in the case of any other species of interstitial cell. The debris, and the contents of the dissolved chyle cells, as well as the other matters which have already subserved the nutrition of the villus, pass into the looped network of lacteals, which, like other lymphatics, are continually employed in this peculiar function. As long as the cavity of the gut contains chyme, the vesicles of the terminal extremity of the villi continue to develop, to absorb chyle, and to burst, and their remains and contents to be removed along the lacteals. When the gut contains no more chyme, the flow of blood to the mucous membrane diminishes, the development of new vesicles ceases, the lacteals empty themselves, and the villi become flaccid. The function of the villi now ceases till they are again roused into action by another flow of chyme along the gut. During the intervals of absorption, it becomes necessary to protect the villi from the matters contained in the bowel. They had thrown off their protective epithelium when required to perform their functions, just as the stomach had done to afford gastric juice, and the intestinal follicles to supply their peculiar secretions. In the intervals of digestion the epithelium is rapidly reproduced.\textbf{Fig. 4.}

![Extemity of a villus with its absorbent vessels distended with chyle, and the vessels in its coats. Very magnified.](image)

The researches of Mr. Goodir have likewise thrown much light on the general process of secretion. He shows, by an admirably selected series of observations (chiefly on the lower animals), that secretion is a function of the nucleated cell. If a whole organ, especially a liver, or a secreting portion of the internal surface of the ink-bag of *Loligo vulgaris* (Lamarck) be carefully freed from adhering secretion by washing, it will be found to consist almost entirely of nucleated cells, of a dark brown colour. If the organ be dissected out from the nutritive medium, the secreting matter which does not exist in it. The discovery of the secreting agency of the primitive cell does not remove the principal mystery in which this function has always been involved. One cell secretes bile, another cell milk; yet one cell does not differ more in structure from the other, than the lining membrane of the duct of one gland from the lining membrane of the duct of another. The general fact however, that the primitive cell is the ultimate secreting structure, is of great value in the biochemical science inasmuch as it connects secretion with growth, as phenomena regulated by the same laws. The force, of whatever kind it may be, which enables one primary formative cell to produce nerve and muscle, by the formation of itself of the common materials of nutrition, is identical with
that force which enables one primary secreting cell to distend itself with bile and another with milk.

Instead of growth being a species of imbibing force, and secretion on the contrary a repulsive, the one centripetal, the other centrifugal, they are both centripetal. Even in those cases where the two processes, growth and secretion, do not differ. The primary formative cell, after becoming distended with its peculiar nutritive matter, in some instances changes its form according to certain laws; and then, after a longer or shorter period, dissolves and disappears in the intercellular space in which it is situated; its materials passing into the circulating system if it be an internal cell, and being blown off if it be an external cell. The primary secreting cell, again, after distension with its secretion, does not change its form so much as certain of the formative cells, but the subsequent stages are identical with those of the latter. It bursts or dissolves, and throws out its contents either into ducts or gland-cavities.

The general fact of every secretion being formed within cells, explains a difficulty which has hitherto puzzled physiologists, namely, why a secretion should only be poured out on the free surface of a gland-duct, or secreting membrane. We have attempted to illustrate Mr. Goodair's views by the accompanying figure.

Fig. 5.

1. Cells from the kidney of Rana esculenta; the contained secretion is dead-white and presents a characteristic appearance.
2. Cells from the liver ofasts (Leptosynapsis).
3. Cells from the rectum of a bat (Rhinolophus ferrumequinum). In this instance the bile is contained in the cavities of the secondary cells, which constitute the nucleus of the primary cell.
4. Cells from the mammae of a bitch. In addition to their nuclei these cells contain milk-globules.

1. Persistent tissues. We now proceed to the histological and chemical investigation of the most important constituents of the human organism.

1. Adipose tissue is usually associated with areolar tissue (which see), the two being generally known collectively as cellular tissue. It must be distinguished from fat, the former being a membrane of extreme tenuity in the form of closed cells or vesicles, while the latter is the material contained within them. The membrane of the adipose vesicle does not exceed the 20,000th of an inch in thickness, and is quite transparent; it is moistened by watery fluid, for which it has a greater attraction than for the fat it contains. Each vesicle is a perfect little organ, varying, when fully developed, from the 300th to the 800th of a line; minute capillaries may be observed on their external surface. When fat-vesicles are deposited together in large numbers, as is usually the case, they assume a more or less regular polyhedral form from their mutual pressure.

Fig. 6.

When the first traces of fat appear is not accurately known. In a well-formed five-months human fetus Valentin found in the subcutaneous cellular tissue of the sole of the foot not merely fat-cells, such as occur in adults, varying from the ordinary size to the 125th or 100th of a line, within and around which were numerous small vessels (Fig. 6, a), but other forms which threw more light on their structure and development. In some the surrounding cell-membrane was much more distinct than as it occurs in adults (b). In others there appeared to be a deposition of fat, not occupying the whole space of the cell (g); the remainder of the cell having often a striped or streaky appearance, and forming a lateral projection; this is seen in c, and in a more marked degree in d and e. In other cells there were observed to be two vesicles, separated by a septum, against which they were partially flattened by pressure (g), or merely separated by a constriction in the external walls, as in f. This form leads us to conclude that fat-cells increase by division. For the chemistry of this constituent we must refer to the article Fat, P. C., and to an early part of the present article. It is sufficient here to remark that the fat-vesicle of the human subject contains margarin, a solid, and olein, a fluid fat. These sometimes separate spontaneously, presenting a very beautiful microscopic appearance. The margarin collects in a spot on the inner surface of the cell-membrane, and presents the appearance of a small star, whilst the olein occupies the remainder of the vesicle, unless when the quantity of fat in it is rather smaller than usual, in which case we may observe a little aqueous fluid between the olein and the cell-membrane. We have attempted to depict this separation in h.

2. Pigment.—In certain parts of the animal organism we meet with definite and well-marked colorations, not dependent on any peculiar arrangement of fibres, etc., but on the presence of pigment-granules of various colours. These granules are usually inclosed in cells, termed pigment-cells. In all races of men we find a most remarkable development of these cells on the inner surface of the choroid coat of the eye, where they form several layers known as the Pigmentum posterius. They are probably always mingled with the epithelial cells, giving rise in the dark races to the deep colour of the skin and presenting themselves in the white races in the form of flecks, the areola round the nail, &c. The pigment-cells are usually fat and laterally compressed into the polygonal form. The granules in their interior are extremely minute, retain their dark colour under high magnifying powers, but exhibit various forms. In the choroid membrane of the human eye their form is very regular; in the adult no nucleus can be seen, a structure which is obvious in corresponding cells from the fetus. The pigment-cells have not always a simple rounded or polygonal form; they sometimes present remarkable stellate prolongations and other singular shapes, which we have attempted to depict in Fig. 9, representing pigment-cells from a frog. a, b, c, d, e, and g, Fig. 9, are representations of various pigment-cells from its choroid coat, while f is intended to exhibit the stellate shape in which these cells occur on the skin of that animal. The nucleaus

Fig. 7.

Cells from the choroid coat of an adult.

Fig. 8.

Similar cells from a fetus at the third month.

Fig. 9.
is sufficiently obvious in one of the cells in a, in c, d, e, and f. Little is known of the chemistry of the animal pigments. Scherer has made three analyses of the black pigment from the eye of the ox, from which he concludes that it consists of Carbon 58.294, Hydrogen 6.918, Nitrogen 13.768, Oxygen 22.880.

From these analyses it appears probable that the black pigment contains a larger amount of carbon than any other constituent of the animal body.

3. Horny tissues.—Under this general name are included not only true horns, but feathers, hairs, cuticle, and the various forms of epithelium and the stratum corneum. We shall confine our observations to the microscopic characters of epithelium and hair, and then briefly advert to the general chemical characters of the class.

The epithelium may be regarded as a delicate cuticle covering the free internal surfaces of the body, just as the epidermis (to which it is closely allied) invests the external surface. Some of the uses of the epithelial cells have been already noticed in our remarks on isolated cells, in addition to their obvious use in protecting the surfaces on which they are placed. This structure was first investigated by Henle (in Müller's Archiv, 1838), and has been since carefully examined by Bowman (art. 'Mucous Membranes,' in Todd's 'Cyclopedia of Anatomy and Physiology,' 1842), Goodair, and others. From the forms presented by the epithelial particles they have received different names. Henle divided them into pavement or tissued epidermis, cylinder epithelium, and ciliated epithelium, and although they frequently run in one another, yet on the whole these distinctive terms are serviceable.

Fig. 10.

The pavement epithelium consists of broad flattened particles, or scales, having an angular outline and a nucleus; these scales form layers of extremely variable thickness. Fig. 10, A, shows very clearly how they are superimposed over one another, forming an efflorescent protection to the basement membrane beneath them. As a general rule the nucleus is large in proportion to the youth of the cell. In this figure we have attempted to exhibit these cells in two stages, a recent and a mature stage. In the young cells marked a the nucleus is relatively much larger than in b. This figure is intended to represent the epithelial scales of the frog: the larger cells, b, lying upon the younger and smaller cells, a.

This form occurs on all synovial and serous membranes, and on most of the mucous membranes.

In the cylindrical epithelium the particles have the shape of small rods disposed endways on the basement membrane in a single layer. In consequence of their mutual compression they usually assume a prismatic rather than a cylindrical form, and hence Bowman applies the term prismatic to this form of epithelium. This form is perhaps best seen on the villi of the small intestine, and on the conjunctival surface of the cornea of the eye. We have attempted to depict the latter in Fig. 10, B.

The ciliated epithelium is little more than cylinder epithelium, but instead of these are scattered numerous cilia or delicate filaments, these are observed in actual motion (Fig. 10, C). When in motion each filament appears to bend from its root to its point, returning again to its original state like corn moved by the wind. The motion of the cilia is independent of the will of the animal, but seems even to be independent of the life of the rest of the body; it has been seen after the death of the animal, and proceeding with perfect regularity in parts separated from the body. Dr. Carpenter states that ciliary movement has been observed fifteen days after death in the body of a tortoise. The motion may be readily observed in the oyster or mussel. In the human subject this form of epithelium exists in the sinuses, except with various offsets, as the nasal cavities, maxillary and ethmoid tubes, lacrimal ducts, &c., and in the upper part of the vagina, the uterus, and the fallopian tubes. Its purpose is evidently to propel fluids over the surfaces on which it occurs.

Hair. The shaft of the hair is that portion which is fully formed and projects beyond the surface. On examination we find it lodged in a follicular involution of the basement membrane (Fig. 11, a), which usually passes through the cutis into the subcutaneous muscular tissue. This cuticle and the cuticle of the hair is a bony-like substance formed by the direct action of the hair on its own substance. The hair grows from the bottom of the follicle, and the cells of the deepest stratum, resting on the basement-membrane, are very similar to those which in other parts are transformed into scales of cuticle. A gradual enlargement occurs in these cells as they form the soft bulk of the hair, which indeed gives it its size to this circumstance. If the hair is to be coloured, the pigment-grains are also here developed, for the most part in scattered cells, which may send out radiating processes; at other times, in a diffused manner around the nucleus of the cells generally. It frequently happens that the cells in the axis of the bulb become loaded with pigment at one period, and not at another; so that, as they pass upwards in the shaft, a dark central tract is produced of greater or less length, often only in irregular patches, and the hair appears here and there to be tubular. e. The shaft is much narrower than the bulb, and is produced by the rather abrupt condensation and elongation into hard fibres of the cells, both of which contain pigment and those which do not. The granules of pigment assume a linear arrangement between the fibres, which are firmly united into a solid rod by a material similar, it may be supposed, to that which cements the scales of the cuticle.

The human hair has a proper bark, or cortex, formed in the following way:—A single layer of the cells immediately surrounding these about to form the fibrous tissue of the shaft are seen near the bottom of the follicle to assume an imbricated arrangement (Fig. 11, c), and gradually to mount on the hair, becoming more compressed against it in their ascent, until they form upon its surface a thin transparent colourless film, in which the outline of the delicate cells is still exhibited by elegant and exceedingly fine sinuous lines.

Fig. 11.
The fibrous interior and this peculiar cortex together compose the shaft of the hair. By the continuance of the outer portion of the shaft from the follicle, fragments of the cuticular lining of the latter are apt to be drawn up upon the hair, sided probably in this by the imbrication of its surface, and are often found clinging around, is for some way, but they are not to be regarded as any part of the hair itself. From the preceding description it will be evident that the fibrous part of the hair is a peculiar development of the cuticular cells resting on the bottom of the follicle, that the imbricated cortex is formed by a single series differently developed at the circumference of these, and that beyond this series comes the cuticular lining of the follicle, so that the hair is neither covered nor underlaid by cuticle, but it is in fact the moulded outside of the bottom of the follicle.

Fig. 12.

The figure and the description of the structure are copied from Todd and Bowman's *Physiological Anatomy and Physiology of Man*, vol. ii. p. 418.

The chemistry of horny tissues has been specially investigated by Scherer and Van Laer. The following analyses of various tissues of this class have been analyzed by the former chemist (Liebig and Wöhler's *Annalen*, vol. xi. p. 33):

<table>
<thead>
<tr>
<th>Substance</th>
<th>Carbon</th>
<th>Hydrogen</th>
<th>Nitrogen</th>
<th>Oxygen</th>
<th>Calculated from the formula C H N O S P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffalo horn</td>
<td>51.16%</td>
<td>6.82%</td>
<td>2.38%</td>
<td>27.83%</td>
<td>51.52% 50.02% 26.62% 27.71%</td>
</tr>
<tr>
<td>Hair</td>
<td>51.44%</td>
<td>6.48%</td>
<td>2.41%</td>
<td>26.63%</td>
<td>52.02% 25.03% 26.64% 27.71%</td>
</tr>
<tr>
<td>Hair from the scalp</td>
<td>51.44%</td>
<td>6.48%</td>
<td>2.41%</td>
<td>26.63%</td>
<td>52.02% 25.03% 26.64% 27.71%</td>
</tr>
</tbody>
</table>

From the analyses of Van Laer it appears that the average amount of sulphur in human hair is 5 per cent. From a series of well-defined experiments he concludes that "the hair consists essentially of:

1. A connecting medium consisting of a tissue yielding gelatin, and represented by the formula C H N O S.

2. Of bisulphate of protein, C H N O S.

The large amount of sulphur is the cause of its colour being affected by various metallic salts. As there is no constant difference to be observed in the results obtained by the analysis of hair of various tints, it is to be presumed that the colour is dependent on peculiar arrangements of the ultimate particles." Hair further contains about 0.4 per cent. of persulphate of iron, which is supposed by Van Laer to be chemically combined with the protein.

4. Fibrous and Arterial tissues.—Fibrous tissue is now usually considered under two heads, namely as the white and the yellow fibrous tissue.

White fibrous tissue occurs in ligaments, tendons, and membranes requiring great strength. On carefully dissecting away the areola; tissue with which it is associated, it seems, when examined under the microscope, to consist of extremely delicate fibrillae running parallel to one another, and taking an undulating course. There is however reason to believe it does not in reality consist of a bundle of fibrillae, but that it is simply a mass with longitudinal parallel streaks, and which has a tendency to split up in a longitudinal direction (Fig. 14, a).

Yellow fibrous tissue differs in many essential points from the preceding form. It is remarkably elastic, is of yellow colour, and is arranged in bundles or fibres, invested by a thin sheath of areolar tissue. In man we find it extended between the laminae of the vertebrae, in several other ligaments, and in the transversalis fascia of the abdomen. It forms the ligamentum nuchae of animals. Examined under the microscope it is seen to consist of fibres varying in diameter from the 5000th to the 10,000th of an inch. They bifurcate or even divide into three, and freely anastomose with each other.

Fig. 13.

The two elements of Arterial Tissue in their natural relations to one another, a. the white fibrous element, with cell-nuclei, b. sprawling visible in the white fibrous tissue, c. fibrille of the yellow element, far finer than the rest, but having a similar minute diameter, d. nucleated cell-nuclei, often seen apparently loose.
These two tissues may be most easily discriminated by the addition of a drop of dilute acetic acid, which at once swells up the former and renders it transparent, whilst it produces no change in the latter. It thus brings into view corpuscles of an oval shape, which are probably the nuclei of the cells from which the bands have been originally produced. Oval corpuscles (Fig. 14, d), either altogether isolated or having very delicate prolongations with the adjacent threads, are sometimes noticed. They seem to be either advancing or receding stages of the tissue.

In Fig. 15, which represents the aracidal tissue from beneath the skin of a five-months foetus, we can perceive the cells elongating into fibres.

In a chemical point of view the leading difference between the white and yellow tissues is, that the former is acted on by acetic acid in the manner already described, and yields a considerable amount of gelatin in boiling; whilst the latter resists the action of acetic acid, and yields little or no gelatin.

5. Nervous Tissue.—In a microscopic point of view nervous tissue may be separated into two elements, the vesicular and the fibrous. The vesicular nervous matter is grey or cinctorous in colour and granular in its texture, containing nuclei in its vesicles, and being largely supplied with blood. The fibrous nervous matter is, on the other hand, usually white, and composed of tubular fibres, although in some parts it is grey, and consists of solid fibres; it is also less vascular than the preceding. The former is more immediately associated with the mind, and is the originating seat of the force manifested in nervous actions; whilst the latter is simply the propagator of impressions made on it. The union of these two kinds of matter constitutes a nervous centre, and the threads of fibrous matter which pass to or from it are called nerves. The smaller nervous centres are termed ganglia; the larger ones are the brain and spinal cord.

Two species of primitive fibre have been observed by microscopists in the fibrous matter; they have been named the tubular fibre, or the nerva-tube, and the gelatinous fibre; the latter is comparatively rare, and is seldom found except in the sympathetic system.

The tubular fibre is a tube composed externally of a fine transparent homogeneous membrane, very much resembling the sarcolemma of muscle, which will be presently noticed. Nucleated cells may however be occasionally seen in it, as in Fig. 16, which represents a portion of the sciatic nerve of a frog. This may be termed the tubular membrane of nerve.

The contents of this tube consist of a soft, semi-fluid, whitish, pulpy substance, which is readily pressed out of its cut extremity. This is termed by Schwann the white substance, since the white colour of the nerve-tubes is dependent on it. Within this and occupying the centre of the tube is a transparent, somewhat flattened band, which is extremely delicate, and in which it seems impossible to recognise any more definite structure. Hence the tubular fibre consists of three distinct elements.

The tubes when quite fresh are perfectly cylindrical; but very slight pressure or almost any disturbing influence gives rise to swellings or enlargements in the course of the fibre, causing it to assume a varicose appearance. Two conditions seem to favour the production of this change: namely, a feeble power of resistance in the tubular membrane, and a semi-fluid state of the contained nervous pulp. In the nerves of the special senses the tubes are very delicate in structure, and are very apt to exhibit this change of form, and in the brain and spinal cord they present the same tendency. We mention this appearance because Ehrenberg formerly observed that these varicosities were natural and existed during life, and that they furnished a valuable morphological character of the nerves of the spinal sense and the cerebro-spinal centres.

In point of size the nerve-tubes present considerable variety even in the same trunk; and in the different classes of animals the differences are well marked.

In man and other mammals they vary from the 1024th to the 6500th of an inch in birds, from the 2000th to the 3000th of an inch; in reptiles—from the frog—from the 1296th to the 2280th of an inch; in fish—in the eel—they are the 1043rd of an inch, and in the optic nerve of the cod-fish they are the 650th of an inch. These primitive tubules present no subdivision or branching. Whatever be the connexion which each primitive tubule forms with the nervous centre and with the textures to which it is distributed, it passes from one point to the other without any change, save perhaps in size, and without any communication with neighbouring tubules, beyond possibly investment by a common sheath.

The gelatinous nerve-fibre is a term applied by Hesse to certain fibres occurring principally in the sympathetic nerve, and which may be regarded as its distinctive element. They are flattened, soft, and homogeneous in their appearance, bearing a considerable resemblance to unstriped muscular fibres; and like them, they contain numerous cell-nuclei, which are frequently arranged in a tolerably regular manner. These nuclei are brought in view by acetic acid, which dissolves the rest of the fibre, leaving them unchanged. These fibres contain nothing analogous to the white substance of Schwann, and hence are devoid of that whiteness which characterises tubular fibre. It seems that the grey colour of certain nerves depends chiefly on the presence of a large proportion of the gelatinous fibres. Hence they are sometimes termed grey fibres. They are usually smaller than the tubular fibres, their diameter ranging between the 6000th and the 4000th of an inch. Both classes of fibres appear to run continuously from one extremity of the nervous cord to the other, without anything like union or anastomosis; each ultimate fibre probably having its distinct office which it cannot share with the others.

We now proceed to the consideration of the vesicular nervous matter, which in its normal form may be regarded as glabular (Fig. 16, A, c, and B, e). This form is however liable to great variation, and from the compression to which these nerve or ganglion-glubules, as they are termed, are exposed, they may become oval or polygonal, or they may extend...
into one or more long processes, giving them a caduceus or star-like aspect.

The wall of each vesicle consists of an exceedingly delicate mass, containing a soft but tenacious finely granular mass. The nucleus is generally eccentric, much smaller than the containing vesicle and adherent to some part of its interior. Its structure is apparently the same as that of the outer vesicle. The nucleus is a minute, remarkably clear, and brilliant body, also vesicular, enclosed within the nucleus. The processes to which we have alluded contain the same granular matter as the cells, with which they seem to be continuous. They are extremely delicate, and generally break off close to the nucleus; sometimes however they may be traced to a considerable distance, and will be found to divide into two or three branches, which undergo further subdivision. It is most probable that they either serve to connect distant vesicles or that they become continuous with the flattened bands occurring in the centre of the tubular element. In most situations where vesicular matter is found in the nervous centres, tubular fibres and sometimes both varieties of fibre are also present. We have attempted to depict this union in Fig. 18.

The varying amount of phosphorus has been supposed to stand in some connexion with the mental powers; this view must however at present be deemed merely hypothetical. The nerves according to L'Heritier contain more albumen, less solid and more soft fat, than the brain.

Pacinian Corporules. These bodies, so called from Pacini their discoverer, are found in the human subject in great numbers in connexion with the nerves of the hand and foot, but they also exist sparingly on other spinal nerves and on the pleuraxes of the sympathetic, though never on the nerves of motion. In the mesentery of the cat they may be almost always detected by the naked eye, being pellucid oval grains rather smaller than hemp-seeds.

A gives a correct idea of their relation to the nerves in the palm and sole. In the human subject they vary from the 10th to the 20th of an inch. The structure of these bodies is highly singular. They consist, first, of a series of membranous capsules, from thirty to sixty or more in number, enclosed one within the other; and, secondly, of a single nervous tubular fibre enclosed in the stalk, and advancing to the central capsule, which it traverses from end to end.

The numbers in each instance represent the mean of six animals:—

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<tr>
<th></th>
<th>Infants</th>
<th>Youth</th>
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<th>Media</th>
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</tbody>
</table>

The Chemistry of Nervous tissue. In the 'Annales de Chimie,' for 1841, there is a memoir by Fresny on this subject. From the fatty matter of the brain, which usually amounts to 5 or 6 per cent., he isolated several secondary compounds; namely, 1. Cerebric acid; a white substance in the form of crystalline grains, abounding in carbon, and containing a minute proportion of phosphorus. 2. Cholesterin; 3. Oleo-phosphoric acid, a peculiar fatty acid containing about 2 per cent. of phosphorus in the form of phosphoric acid; and 4. Traces of olein, margarin, and fatty acids. The following table has been drawn up by L'Heritier from his own researches:—

Pacinian corporules from the mesentery of a cat; intended to show the general construction of these bodies. The stalk and body, the outer and inner capsule, with the central cavity, are seen.

A, Arterial twig, ending in capillaries, which form loops in some of the interior layers of the mesentery; B, penetrates in the central capsule. A, The Sherrin capsule of the stalk, prolonged from the nerve-capsule. B, Nerve tube advancing to the central capsule, there losing its white substance, and stretching along the stalk to the opposite end, where it is fixed by a tabular enlargement. Todd and Bowman.

In the above figure, which exhibits the general structure, the ten or fifteen innermost capsules may be observed to be in contact with one another, while the rest are separated by a clear space containing fluid.

Respecting the function or use of these corporules no satisfactory account has yet been given. Pacini himself inclined to believe that they may be concerned in the phenomena of what is called animal magnetism.

Muscular tissue. There are two forms of muscular fibres, differing extremely in their microscopic characters. The fibres of the voluntary muscles, as well as the fibres of the heart and of some of those in the oesophagus, are striped or striated; while all other muscles, including those of the alimentary canal, the uterus, and bladder, all of which are involuntary, are unstriped or non-striated. [Murray, P. C.]
The elementary fibres of the voluntary muscles are arranged in sets parallel to one another, whilst those of the involuntary muscles usually cross at various angles, and interface, forming membranous organs, enclosing a cavity which their contraction serves to contract.

The striated fibres are usually of about the same length as the muscle to which they belong. In the sartorius they often exceed two feet in length, while in the stapedius (in the middle ear) they are not two lines. They vary in diameter from the 60th to the 1400th of an inch, being largest in crustaceans, fish, and reptiles, where their irritability is most enduring, and smallest in birds, where it is most evanescent. In man their average diameter is the 400th of an inch. The fibre always presents upon and within it longitudinal dark lines, along which it subsequently splits up into fibrillae; but it is by a fracture alone that these fibrillae are obtained; they do not exist as such in the fibre. Sometimes, on the application of violence, cleavage takes place in a different manner, in a plane at right angles to the long axis of the fibre. In this case fibrillae and fibrillae are retained; and the cleavage is just as natural as the former, though less frequent.

Fig. 21.

A. Fragments of elementary fibres, showing a cleavage in opposite directions.

B. Longitudinal cleavage. The longitudinal and transverse lines are both seen. c. Fibrillae separated from one another by violence at the broken end of the fibre, and marked by transverse lines equal in width to those on the fibre. c' represents the appearances commonly presented by the separated single fibrilla (more highly magnified). At c the borders and transverse lines are all perfectly rectilinear, and the included spaces perfectly rectangular. At c' the borders are sawed and the spaces beak-like. When most distinct and definite the fibilla presents the former of these appearances. a. Transverse cleavage. The longitudinal lines are usually visible. a. Incomplete fracture following the opposite surface of a disc, which stretches across the interval and retains the two fragments in connection. The edge and surface of this disc are seen to be minutely granular, the granules corresponding in size to the thickness of the disc, and in lig distance between the joint longitudinal lines. b. Another disc, nearly detached. b'. Detached disc more highly magnified, showing thenumerous elements. bowman in Todd's Cycliographia.

Hence the fibre must be regarded neither as a bundle of fibrillae nor a pile of discs, but as 'a mass in whose structure there is an irritation of the existence of both, and a tendency to cleave in the two directions.' The same particles compose the disc and the fibrilla, and they have received the name of the primitive or sarcomatous elements. The cross stripes of the fibre are formed, according to the views of almost all the best observers of the day, by the apposition, side by side, of the dark points seen on the separated fibrilla. That they are not caused by a structure distinct from the fibrilla, and present only on the surface of the fibre, is evident, according to Todd and Bowman, from the following facts:

1. That a transverse section of a fibre shows it to be solid and not hollow, and that the ends of the fibrilla, as seen on its section, exist throughout its interior, just as on its surface.

Fig. 22.

Transverse section of three elementary fibres of the dried posterior muscle of a teal, treated with weak nitric acid.

2. That fibrilla taken from any part of a fibre are marked with light and dark points, corresponding in distance and force with the transverse stripes of the fibre.

P. C. S., No. 167.

3. That with a high magnifying power applied to a single fibre we may bring all parts of its interior into focus in succession, and perceive throughout the same kinds of stripes.

The Sarcomatous or tubular sheath enclosing the striated fibre, consists of a transparent, very delicate, but tough and elastic membrane, which isolates the fibre from all other tissues. It most commonly has no appearance of structure, but occasionally small corpuscles, the remains of cell-nuclei, are observed in it.

Fig. 23.

If the fibre be immersed in acid, it swells, bursts the sheath, and forms small protrusions or herniae.

The researches of Valentia and Schwann have thrown much light on the development of muscular tissue in the embryo. In its earliest stage, muscle consists of a mass of uninucleated cells which first arrange themselves in a linear series, and then unite to form the elementary fibres.

Fig. 24.

Stages of development of striated muscle fibres.

a. Arrangement of the primitive cells in a linear series.
b. The cells united, the nuclei separated, and some broken up; longitudinal lines becoming apparent. From a fertilised embryo, three inches long.
c. e. Transverse stripes apparent. c. The nuclei are internal and lodged the fibre; in d they are prominent on the surface. From a fertilised embryo, two months old.
d. Transverse stripes fully formed and dark; nuclei disappearing from view. From the human infant at birth.
e. Elementary fibre of a perfect fetus, treated with acid, showing the nuclei a from Schwann. The rest from Bowman.

As the cells unite, a depot of contractile material gradually takes place within them. The deposition assumes a granular form, the granular or sarcomatous elements being of the same size as in the perfect muscle; for this reason the transverse stripes resulting from their apposition are of the same width as in the adult. Muscles grow by an increase, not of the number, but of the bulk of their elementary fibres.

The unstriated or non-striated fibres consist of flattened bands, generally of a pale colour, bulged at intervals by oval or elongated corpuscles. Their texture seems to be homogeneous. By transmitted light they have usually a soft and very finely motled aspect; their ordinary diameter varies from the 3000th to the 2000th of an inch.

Chemical characters of Muscle.—In consequence of the difficulty that exists in separating muscular fibre from aseptic tissue, vessels, and nerves, it is impossible to speak with certainty regarding its behaviour towards re-agents. Playfair and Bockeann have analyzed the dried muscular flesh of the ox, and found it to be identical in its composition with dried fibres. For analyses of the flesh of man and of various animals we refer to Simon's Chemistry, vol. ii. p 422-425.

7. Cartilaginous Tissue.—The simplest form of cartilage consists merely of nucleated cells, and closely resembles the cellular tissue of plants. This kind is found in the rudimentary spinal column of the early embryo; it also exists in the chords dorsals of the cartilaginous fishes. In other kinds of cartilage the cells are embedded in an intercellular substance presenting certain varieties of appearance.
The canals which are everywhere found traversing variously the substance of the bone, and giving passage to the blood-vessels for the nourishment of the tissue, are called Haversian Canals, a name given them in consequence of Clapton Havers having been the first who gave a full account of them. The parietes of these canals have a laminated arrangement. The laminae themselves are numerous and placed concentrically; the internal lamina, that which is in immediate contact with the vessel or vessels, being the most distinctly marked, and each succeeding one having a less distinct outline.

Besides the concentric laminae, there are others which surround the exterior of the bone, and may be known as the superficial lamina. In connection with both the concentric and superficial lamina are a third set, which cannot belong to either of the other orders, but which are placed between them, and form the bond of union between each system.

Much has been lately written on the bone-corpuscles. These are small cells, of oval form, placed between the laminae, and having numerous distinct tubes running from them in almost every direction. They have been sometimes compared to a spider with many legs. The corpuscles, or, as they are occasionally called, the calcigerous cells, have a definite relation to the Haversian canals and to each other.

The Haversian Canals, the osseous laminae, and the bone-corpuscles are therefore the leading points to be mentioned in treating of the structure of the bone. Upon a closer view, however, it will be seen that it is only the lamina which are

Bone; the canals and corpuscles are spaces existing in bone, and are not really necessary to the existence of osseous tissue, though they are requisite where the amount of substance is appreciable to the unaided senses.

Transverse section of the dense portion of the femur.

Of the substance of Bone, or Hyaline Substance—The substance of bone has been considered, with but one or two exceptions, as homogeneous, and without appreciable structure. If it be examined however under advantageous circumstances, with high magnifying powers, there will be no difficulty in detecting a very definite though delicate structure. A very small portion of a thin plate of bone should be taken for the purpose of examination; such may be found in the ethmoid bone of small animals, as of the rat. If the piece is properly chosen it will be found to contain no Haversian canals nor corpuscles, but will be extremely thin and transparent. A piece of this kind will present a delicate granular aspect with the surface nodulated. This granular appearance proceeds from the substance of the bone being composed of minute irregularly spherical granules. This structure may be traced without much difficulty in any specimen of bone, although it varies much in distinctness in different specimens. The object should be placed between two slips of glass with a little plain water for examination. A delicate spiculum from the point where ossification is going on illustrates the granular tissue exceedingly well. The granules may be obtained separated from each other, so that each individual may be examined independently of the others.

Ultimate osseous granules, obtained by depriving bone of its animal matter.

When seen in this manner they exhibit a tolerably regular character, being mostly spherical, though a few have an oval form. In a few specimens the oval form predominates.

Of the Laminæ.—The forms assumed by the osseous tissue is that of laminae, and these laminae have a definite arrangement, so much so that three distinct systems are recognized, namely: lamina of the Haversian canals; secondly, the lamina which connect the Haversian systems; and, thirdly, the lamina which form the surface of the bone, and enclose the two previous orders. The lamina of the Haversian canals have a concentric arrangement, and when divided transversely present a series of more or less distinct and perfect rings.
They vary very much in number, but the most common amount is ten or twelve. Of these, the internal lamina, that which forms the parietes of the Haversian canal, is most distinctly marked, while each succeeding one as we proceed outwards becomes less distinct. Connecting these Haversian systems is a second series of laminae, without which the former would exist but as a bundle of loose tubes (Fig. 27, c). In this substance we find the laminated arrangement less distinct, far less regular, and the laminae individually subject to great irregularity of thickness. They are generally more transparent than either the Haversian or external system. The last division consists of those laminae which surround the exterior of the bone. These have greater individual extent, but are the least numerous. They are continuous with the lamina of the Haversian system whenever the latter arrives at the surface of the bone; the external lamina if this case being continuous with the inner lamina of the Haversian system.

The effect of madder upon the osseous system, when given to an animal with its food, may here be noticed, since the colour is imparted to the laminae. By introducing madder into the stomach, a deep red tinge is very soon observed: in a pigeon the bones were rendered brilliantly red in twenty-four hours. A similar effect was produced on a young pig in three weeks. On making sections of bone so affected, the colour is found to be present in the external lamina of the bone, and in the inner lamina of the Haversian system, thereby proving that the action of colouring takes place upon those surfaces which lie in contact with vessels.

Of the Haversian canals. These canals must be considered in relation to their number, their size, and the parts which they contain. The number of canals in a given space vary perhaps a little, but this variation will be regulated in some degree by the situation of the bone, but more especially by its age. Thus the transverse section of the femur of a human foetus of seven months will present many more canals than a section of equal measurement from the femur of an adult. The size of the Haversian canals takes a considerable range, varying from the 500th to the 600th of an inch. The Haversian canals undoubtedly convey passage to blood-vessels, these being their principal if not only purpose.

The corporaee or cells of bone cannot be described as having any definite unvarying shape or size. The general form is a compressed oval, though not uncommonly they are circular. Again, they are sometimes almost triangular in their outline, while in other instances they approach a linear shape. These are the most common varieties of outline to which the bone-cells are subject, as they occur in the bones of man and the higher animals. In the four great classes of animals, namely mammalia, birds, reptiles, and fishes, it has been shown by Mr. Quettet that there are certain characters connected with these cells by which a bone of one class may be distinguished from that of another. He has shown that they are smallest in birds, a little larger in mammals, and largest of all in the reptiles; while in fishes they are altogether unlike those in the preceding classes. The importance of this observation in relation to fossil remains is obvious.

Connected with the cells are numerous delicate branching tubes, which are slightly dilated as they enter the cells. The number arising from each cell does not allow of any very definite enumeration; but, as in two cells we have found, perhaps, of a like number of branching tubes. The general arrangement of the tubes is radiates as regards the cells which form their common centre. The connections are so numerous between the tubes, that a fluid introduced into one cell in a bone, may enter every other cell in that bone. The cells are situated between the laminae, or on their surface; but where concentric laminae occur, as in the ilium, they are placed in circular lines between the laminae, each line of cells having the Haversian canal as an exit common to it and the connecting lamina. When the canals for vessels are in great abundance, the bone-cells are more rarely met with; indeed in some cases they are almost entirely absent.

When the cells are seen by transmitted light, particularly in a transverse section of bone, they are frequently opaque. There is no doubt that the bone-cells perform the function of circulation.

The Chemistry of Osseous Tissue has recently met with much attention from Valentin, Lehmann, Marchand, and more especially Von Bihr. From the bones of the human body has aged forty years, who committed suicide, Lehmann obtained—

<table>
<thead>
<tr>
<th>Substance</th>
<th>Concentration</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphate of lime</td>
<td>66-85</td>
</tr>
<tr>
<td>Carbonate of lime</td>
<td>9-20</td>
</tr>
<tr>
<td>Carbamide of magnesia</td>
<td>1-08</td>
</tr>
<tr>
<td>Chloride of sodium</td>
<td>0-37</td>
</tr>
<tr>
<td>Soda</td>
<td>0-25</td>
</tr>
<tr>
<td>Organic matter</td>
<td>31-62</td>
</tr>
</tbody>
</table>

For a full account of the chemistry of bone we must refer to Simon’s ‘Chemistry,’ vol. ii. pp. 396-414, or Von Bihr, ‘Chemische Untersuchungen der Knochen,’ &c., Schweinfurt, 1844.

9. Tooth. The structures entering into the composition of the teeth are three: dentine, or tooth-substance; enamel; and cement, or more properly tooth-bone. The enamel invests the more prominent parts of the crown, from which points it gradually diminishes in thickness, till it terminates in a line on the neck of the tooth. The cement, or dental bone, is thickest at and near the end of the root, and gradually becomes thinner as it advances towards the crown of the tooth. In a tooth that has been used for some little time, the cement terminates where the enamel commences, but there is reason to believe that a thin layer is continued over the enamel. Of these tissues, dentine, as forming the great bulk of the tooth, and thereby becoming the most important, will first demand our attention. The pulp-cavity occupies the centre of the dentine, and on its surface are superimposed the enamel and the tooth-bone. By drilling the crown and the latter the surface of the fang. These two tissues form a layer of variable thickness in different parts of the teeth. This layer, however, is soon worn off when the tooth comes into use.

If the enamal and cement be removed from a tooth, and the dentine alone allowed to remain, the tooth still retains much of its original shape, losing most at the two extremities, while in point of size the loss sustained is comparatively slight; thus showing the dentine to constitute by far the greater portion of the tooth.

The dentine is made up of two distinct parts: first, dentinal tubes; secondly, intertubular tissue. The tubes have distinct parietes, equal in thickness to their calibre. In some instances they appear to contain a minute granular matter, but in many, perhaps in the majority of cases, they are perfectly free from solid contents. The tubules, in section, are elliptical, being for examination, the dental tubes may be traced from their commencement on the surface of the pulp-cavity, to their termination at the junction of the cement, and the dentine on the enamel of the last of the tubes that have been passing into these external structures. The tubuli commence at a right angle with the surface of the pulp-cavity, and proceed outwards towards the surface of the tooth, giving off in their way numerous small branches, which form yet other similar branches from neighbouring tubes, anastomose with them, or meeting with simple cells in the intertubular tissue, there terminate. Towards the surface of the dentine it is not uncommon to see a tube after its course, by forming another, form a loop. The tubes all communicate in the pulp.
cavity, and pass outwards towards the surface of the dentine. Their course, as regards each other, is divergent, so that the proportion of the intertubular tissue increases relatively as their distance from the pulp-cavity is greater or less. This preponderance of the intertubular over the tubular tissue near the periphery of the tooth is, however, in a considerable degree lessened by the more frequent branching of the tubes, and by the occurrence of cells near the surface of the dentine. If a single tube be traced through its whole extent, it will be found to make two undulations; and in addition to these, which are called the primary curves, a number of smaller undulations. In examining this structure a thin section may be taken from the face, and, with the aid of the microscope, viewed by transmitted light. A tube will then appear as a very definite dark line pursuing its tortuous but definite course towards the surface, giving out numerous minute branches on its way, and at last dividing into two terminal branches, which either by passing into a cell of the intertubular tissue, or by anastomosis with a collateral tube, or by passing into the cement. If a section of the dentine and enamel be taken, then the tubes will be seen to give off comparatively few branches till they come near to the latter, when they divide and subdivide, and some few terminal branches may be traced entering the enamel. It is by no means uncommon for a tube in its course to suddenly dilate and give off branches from the dilatation, then again contract, and pursue its original course. In such a case the dilatation forms a cell in every similar way to the bone-cell. The point of the greatest diameter of the dental tubes is at their commencement on the walls of the pulp-cavity, though in their course proceeds to the division of the trunk into two terminal branches they suffer but little loss in calibre. In tracing this structure in the teeth of various animals, we find every form of branching; sometimes the branches are few, in others extremely numerous; in some instances they are given off from one side of the tube only, in others from each side; but whatever the modification in the number or form of the branching given out, the primary tube always commences by an open extremity on the walls of the pulp-cavity, or into the walls of a canal for a blood-vessel; and the direction taken by the tubes is invariably towards the periphery of the tooth, always Anastomosing in their way by the numerous branches.

In the temporary, and not unfrequently in the permanent teeth, the tubes, instead of presenting an uninterrupted line, present on their surface numerous indentations, just as though they were covered by a thin layer of a mass of minute hollow tubes, which were united and made to communicate with each other.

The second part composing the dentine is the intertubular tissue, which occupies the spaces between the tubuli, everywhere surrounding and investing them, and thereby contributing greatly in rendering the whole dentine a solid dense mass, the area of the tubes and cells being the only hollow portion. In a favourable specimen of this tissue Mr. Temes observed that it was composed of very minute granules, united to each other on all sides, thus forming a solid mass, of which, in character of formation, oolite would give a coarse illustration. The granularity is best seen near the external surfaces of perfect dentine, or in the tissue when developing. In the intertubular tissue, hemispherical or oval bodies are found, especially near the surface of the dentine of the fang, where they form a layer joining the cement.

**Structure of the Enamel.** — The enamel is the hardest of the dental structures, and being composed of dense, hard, fibrous, placed side by side, and closely united. Their form is an approximation to a six-sided prism, and their size is tolerably uniform, being about the eighth of an inch in diameter. The direction taken by the enamel-fibres is the most part vertical to the surface of the dentine upon which they rest; those therefore which proceed from the flat surface of the crown will rise vertically, while those from the lateral surface of the tooth will be horizontal. When the coronal surface of the dentine is concave, the enamel fibres of the opposite sides of the concavity form with each other angles, and meet at their external ends. This juncture is frequently imperfect, and leaves a fissure, under which the dentine, being less protected from external influence than on the other parts of the crown of the tooth, is more frequently attacked by disease. The fissures on the crown of the molars are often subject to this defect of development. The ends of the enamel fibres are received into shallow hexagonal depressions in the coronal surface of the dentine, from whence in their course they are frequently described. The direction taken by neighbouring fibres is sometimes perfectly parallel; indeed, they often diverge or cross each other at considerable angles. The curves also seem less regular than those, which are formed by the dentine tubes.

**The Bone or Cement.** — Where the anterior parts of the crown of the fang, on entering the cavity of the bone, the cement commences in a layer, gradually increasing in thickness to its termination at the apex of the root, although a very thin (radulminate) layer is continued over the crown, investing the enamel. The histological characters of this structure are so completely identical with those of ordinary bone that we need offer no additional remarks on them.

For the importance of the microscopic investigation of the teeth in the classification of existing and the determination of extinct species of vertebrated animals, we must refer to Professor Owen's "Osteographie," one of the most splendid works ever published.

**Chemistry of the Dental Tissues.** — Von Bibra has instituted numerous analyses of the teeth of man and the lower animals. We select the following by way of illustration:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phosphate of lime, with a little fluoride of calcium</td>
<td>81-68 67-54 8-59 8-59 6-62</td>
</tr>
<tr>
<td>Carbonate of lime</td>
<td>8-88 7-97 4-77 3-88</td>
</tr>
<tr>
<td>Phosphate of magnesia</td>
<td>2-55 2-49 1-34 0-80 0-88</td>
</tr>
<tr>
<td>Sulphuric acid</td>
<td>0-97 0-00 0-88 0-83</td>
</tr>
<tr>
<td>Carvage</td>
<td>5-97 4-50 3-63 2-89 1-62</td>
</tr>
<tr>
<td>Fat</td>
<td>a trace 0-58 0-20 0-40</td>
</tr>
</tbody>
</table>

The osseous portion includes the dentine and cement.

We have thus taken a brief survey of the microscopic and chemical characters of the most important structures entering into the composition of the human body. In addition to, and perfectly distinct from these are numerous morbid products—the results of disease. In this class we must place pus, granular cells, the various forms of morbid tumours, the calculus of the tubercle, sequestrous bodies, &c. These however are not fall within the scope of this article; and for information regarding them we must refer to Vogel's "Pathological Anatomy of the Human Body," an English translation of which has recently appeared by Dr. Day.

**Section III.—Nutrition and the Secretions.**

We shall here notice those points in the chemistry of the blood—the general nutrient fluid—which the labour of recent investigators have evolved since the publication of the article Blood, P. C., and adopt a similar course in relation to the various secretions thus deduced by it.

We shall, in the first place, however, offer a few remarks on nutrition in connexion with nutrition, with the view of bringing into the article Food, P. C., up to the present state of our knowledge. That all nutrition in the body is based on the use of food is not at present adopted by chemists and physiologists, but is not yet completely understood.
There are very strong reasons for believing that foods containing nitrogen are alone capable of conversion into blood, and of forming organised tissues; hence Liebig has termed them the *plastic elements of nutrition*. The non-nitrogenous foods are, according to Liebig, incapable of transmutation into blood, and are therefore incapable of forming organised tissues. They are, however, not without their use; their function lies, according to Liebig, to support the process of respiration (Diathesis). A supplementary food is necessary to attend to the development of heat. These latter foods he terms the elements of respiration.

- Nitrogenous Foods or
  Proteins of Nutrition.
  Vegetable fibrin.
  Vegetable albumen.
  Vegetable casein (casein).

- Non-nitrogenous Foods, or
  Elements of Respiration.
  Fat. Peetine.
  Starch. Bassorine.
  Gum. Wine.
  Grape-Sugar. Spirits.
  Sugar of Milk.

Liebig believes that a second use (an abnormal rather than a natural one) of the second group is in relation to the formation of fat (p. 636). Moreover, the statement contained in the article Fats, that 'gelatin is a highly nutritious principle,' requires some notice. Liebig has established it as a law that 'no nitrogenized compound, the composition of which differs from that of fibrin, albumin, or casein, is capable of supporting the vital processes in animals.' The animal organism, he says, 'unquestionably possesses the power of forming from the constituents of its blood, the substance of its membranes, as of cellular tissue, of the nerves and brain, of the organic part of cartilage and bones. But the blood must be regarded as already formed in everything but form—
that is, in its chemical composition. If this be not done, a period is rapidly put to the formation of blood, and consequently to life.' For this reason gelatin, which, as we have already shown (p. 638), is not a protein-compound, cannot form blood, and therefore will not support the vital processes. The two following facts seem however to show that it has a use in the economy:—1. When in the body of a starving or sick person the fat disappears, and the muscular tissue again takes the form of blood, we find that the tendons and membranes retain their natural condition, and the limbs of the dead body retain their connexions, which depend on the gelatinous tissues.—2. On the other hand, the gelatin of bones devoured by a dog entirely disappears, whilst only the bone-earth is found in the excrements. The same is true of man when fed on food rich in gelatin; as, for example, strong soup. The gelatin is not to be found either in the urine or in the faces, and consequently must have undergone a change, and have served some purpose in the animal economy; in other words, it must have been expelled from the body in a form different from that in which it entered it. From these facts Liebig inclines to the belief that gelatin is serviceable in the formation of cellular tissue, membrane, and cartilage; and that it may tend to the reproduction of such parts of the body as has been mentioned. The gelatinous tissues.

4 And when the powers of nutrition in the whole body are affected by a change of the health, then, even should the power of forming blood remain the same, the organic force by which the constituents of the blood are transformed into cellular tissue and membranes must necessarily be enfeebled by sickness. In the sick man the intensity of the vital force—its power to produce metamorphoses—must be diminished as well in the stomach as in all other parts of the body. In this condition, the uniform experience of practical physicians shows that gelatinous matters, in a dissolved state, exercise a most decided influence on the state of the health. Given in a form adapted for assimilation, they serve to hasten the vital force, just as may be done in the case of the stomach, by due preparation of the food in general. Britteness in the bones of the ground-living animals is clearly owing to a weakness in those parts of the organism whose function it is to convert the constituents of the blood into cellular tissue and membrane; and if we can trust to the reports of physicians who have resided in the East, the Turkish women, in their diet of rice, and the Arab, their flesh, and the condition necessary for the formation both of cellular tissue and of fat. Whether this be the mode in which gelatin acts or not, no one who has seen much medical practice will deny that it is of the greatest value in such cases.

We now proceed to make those additions to the chemical portion of the article Blood which the labours of the last ten years have rendered necessary.

We have already (in our remarks on isolated cells) noticed the additions that have been recently made to our knowledge regarding the blood-corpuscles of various animals. Numerous observations have also been made on the changes in form which the corpuscles undergo in various diseases (Simon's 'Animal Chemistry,' translated, with additions, by Day, vol. i. p. 103, London, 1845; published by the Sydenham Society); also on the effects of various medicines and re-agents on the corpuscles ('An. Ch.,' pp. 107-112). Additional information on the acceleration or retardation of the coagulation may be found in Hambberg's Thesis on that subject published at Uppsala in 1839, and in Simon, 'An. Ch.'

With regard to the chemical composition of the blood, we may regard it as usually containing the following ingredients:

1. Water.
2. Protein compounds. Globulin.
3. Colo...
is dependent on the presence of tribasic phosphate of soda (2 N a O, H O P O 3) ; and as this is the only salt that remains tribasic at a red heat, he concluded that the alkalinity of the blood, as well as of the ash, is dependent on it. The manner in which he accounts for the occurrence of carbonates in the analyses of other chemists is very plausible. On exposing 2 N a O, H O P O 3 O s and N a O, C O 3, or phosphate of soda in which one atom of the base is replaced by an atom of water and carbonate of soda.

This operation causes the salts actually occurring in the blood is however far from settled, Ludwig having during the last few months positively denied Enderlin's statement; (see also C. l., 1846.) Generally speaking it is only possible to analyze in the blood, to determine a few of the most important constituents; as, for instance, the water, fibrin, blood-corpuses (globulin and hematin), and the solid residue of the serum (the organic portion and the salts). For this purpose we may adopt the following simple plan lately published by Fugier. It is based on the fact made known many years ago by Berzelius, that after the addition of a solution of a neutral salt to defibrinated blood, the globules do not (as before) pass through a cycle of filtration. On the addition of two parts of solution of sulphate of soda of specific gravity 1130 to one of blood, Fugier found that the whole of the corpuscles remained on the surface of the filter. The following are the stages of the process. The filter is rinsed, dried, and weighed; the weight of the corpuscles is ascertained by the method indicated, and that of the albumen by coagulating by means of heat the filtered solution. The proportion of water is determined by evaporating a small quantity of the weight of the blood. The filter containing the corpuscles should be dipped in boiling water, which removes any sulphate of soda that may be present, and at the same time renders the corpuscles insoluble. The weight and frequently different processes are requisite to detect those ingredients which occur in small quantity or only in morbid conditions.

Distinctions between Arterial and Venous Blood. — We have already (p. 882) pointed out the circumstance that the external capillary of the blood-corpuses becomes converted during the act of respiration into oxidized protein, and that the bright red colour of arterial blood is owing in part to the modifying influence of the white investing membrane. But there is yet another mode in which it acts. The buffy coat which is frequently observed on the upper part of the clot in inflammatory diseases is very apt to curl up and become concave. Now this buffy coat consists, for the most part, of the oxides of protein — of the very same matter with which the blood-corpuses become invested. For this reason the form assumed by the two laminae on both sides of the little flat body — the corpuscle — results from the action and influence of the buffy coat. The corpuscles and become bi-convex is so strong, that the central portion of the crust becomes entirely depressed. In this form the corpuscles reflect a great deal more light than when, in consequence of the removal of the buffy coat in the capillaries, they have a less bi-concave form.

From analyses of the blood of horses, Simon deduces the following rule regarding the chemical differences of arterial and venous blood. The arterial contains less solid residue generally than venous blood; it contains less fat, less albumen, less hematin, less extractive matter and salts, than venous blood. The blood-corpuses of arterial blood contain less colouring matter than those of venous blood. The arterial blood was taken from the carotids, and the venous from the jugulars.

Composition of healthy human venous Blood. — In a medical point of view the composition of venous blood is the most interesting, because it is from the veins that blood is almost always taken in disease, and because venous blood can naturally only be compared with venous blood for the purpose of ascertaining any deviations that may occur. The following table represents the mean composition of human venous blood without reference to sex:—

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>705-278</td>
</tr>
<tr>
<td>Fibrin</td>
<td>2-104</td>
</tr>
<tr>
<td>Fat</td>
<td>2-346</td>
</tr>
<tr>
<td>Albumen</td>
<td>76-660</td>
</tr>
<tr>
<td>Globulin</td>
<td>148-160</td>
</tr>
<tr>
<td>Hematin</td>
<td>6-309</td>
</tr>
<tr>
<td>Extractive matters and salts</td>
<td>12-014</td>
</tr>
</tbody>
</table>

100 parts of blood-corpuses contained 0-7 of hematin. Hence the blood contains about 20 per cent. of solid constituents, and between 0-2 per cent. of fibrin, and about an equal quantity of fat; the blood-corpuses considerably exceed the albumen in quantity, and contain about 5 or 6 per cent. of colouring matter.

The following table shows the proportions in which we are limited precludes us from noticing the various modifications which the blood undergoes in different forms of disease. The extent of these variations is obvious from the following table, drawn up from Simon's "Animal Chemistry," vol. i., p. 245.

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>915-0 to 728-0</td>
</tr>
<tr>
<td>Fibrin</td>
<td>2-98 to 8-5</td>
</tr>
<tr>
<td>Fat</td>
<td>8-28 to 9-7</td>
</tr>
<tr>
<td>Albumen</td>
<td>181-0 to 52-1</td>
</tr>
<tr>
<td>Globulin</td>
<td>126-6 to 30-2</td>
</tr>
<tr>
<td>Hematin</td>
<td>8-7 to 1-4</td>
</tr>
<tr>
<td>Extractive matters and salts</td>
<td>15-0 to 7-6</td>
</tr>
</tbody>
</table>

Lymph and Cyste. — Closely allied to the blood are the lymph and cyste. These fluids have only recently been submitted to correct chemical examination. In Simon's "Chemistry" the reader will find recent analyses of the former by Marchand and Colberg, L'Heritier, Rees, and Nasse; and of the latter by Simon, Rees, and Nasse.

From the comprehensive classification of the blood we naturally turn to that of the various secretions yielded by it.

The saliva has been analysed by Simon, L'Heritier, and Wright. The following is Dr. Wright's account of healthy saliva. It is of considerable importance, and worth being always remembered after a meal during fasting. Healthy saliva has mostly the specific gravity of 1007-9. When above 1010 or below 1008 it may be considered morbid. Healthy saliva is either alkaline or neutral, generally the former. He believes in the existence of the principle termed ptyalin, although he separates it from the saliva by a new process, which is to pass saliva through ordinary filtering paper, and after filtering it has been accounted for mainly by ptyalin, which residue with sulphuric ether: the ethereal solution contains a fatty acid and ptyalin. It is to be allowed to evaporate spontaneously, and the residue left by evaporation is to be placed upon a filter and acted on by distilled water, which dissolves the ptyalin and leaves the fatty acid. On evaporating this solution to dryness the ptyalin will be obtained in a pure state.

In relation to the presence of sulpho-cyanogen Wright remarks that it is a constant ingredient of the saliva. The proportion, he observes, is temporarily augmented by local stimulation of the salivary glands, as by smoking, chewing salaments, &c. It is also increased by the internal use of arsenic acid and salts of cyanogen, and remarkably so by the use of sulphur. The occurrence of this substance in the saliva is equally interesting in a physiological and in a medico-legal point of view. The circumstance that it forms with the prussic acid a much cheaper blue-red of a beautiful color in which the cyanate of iron, must not be overlooked in examining the stomach in a case of suspected poisoning by opium.

L'Heritier has recorded the mean of 10 analyses of the saliva of healthy persons, made while fasting.

<table>
<thead>
<tr>
<th>Component</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>886-5</td>
</tr>
<tr>
<td>Organic matter</td>
<td>12-6</td>
</tr>
<tr>
<td>Inorganic matter</td>
<td>0-9</td>
</tr>
</tbody>
</table>

The ptyalin formed 2-6 of the 12-6 parts of organic matter.

Mialhe has recently (April, 1845) announced the discovery in the saliva of an active principle analogous in its physical and chemical characters to opium. It is solid, white or greyish white, amorphous, insoluble in alcohol, but soluble in water and in weak spirit. The directions for obtaining it are the following: filter saliva and treat it with five or six times its weight of absolute alcohol, adding it as long as any precipitate occurs. This animal diastase falls in white flakes, which when stirred together with Tolu 0-2 parts of water. The Bile. — It would take up far more space than we could devote to the subject to notice all the additions that have been recently made to the chemistry of the bile. In the year 1838, Denarrove published a treatise on the mastication of organic acid combined with soda. He termed the acid chochic, and obtained it in the following manner: bile, from which the mucus had been precipitated by evaporating on the water-bath, and 10 parts of the dried residue were dissolved in 100 of water, to which 10 of hydro-
chloric acid had been added. Allowing evaporation at a moderate temperature to proceed, it was observed that a dark green oil collected on the surface, while at the same time the fluid remained cloudy, and the remaining fluid to rest for some time, it gradually became clear, with the precipitation of a green deposit. This dark green bitter precipitate is Demarcay's chloric acid, and is regarded by him as consisting of the chloric acid of the urine. The granules of this acid still mixed with maragace, choleretic, pigment, &c. After their removal it forms a yellow spongy matter, which rapidly absorbs oxygen from the atmosphere, is very bitter, slightly soluble in water, and insoluble in alcohol.

The choleate of soda, obtained by adding an alcoholic solution of soda to an alcoholic solution of choleic acid, and then passing a current of carbonic acid through it to remove the excess of soda, possesses all the characters of bile; it yields on evaporation a brown resinous mass, and is soluble in water and in alcohol.

When choleic acid is boiled with hydrochloric acid it yields ammonia, taurine (see Taurine, P. C.), and choloidal acid; the latter being insoluble is deposited. The former usually assigned to choleic acid, taurine, and choloidal acid are, \( C_6 H_{10} O_3 \), \( C_6 H_{12} O_5 \), and \( C_7 H_{14} O_7 \).

But it has been recently shown by Redtenbacher that the formula for taurine should in reality be \( C_7 H_{14} O_7 \); since it contains no less than 28-6 per cent. of sulfur which had been previously altogether overlooked (Leylb and Wollweber, Arch. f. Physiol., vol. 145, 1845). Hence there can be no doubt that the formula for choleic acid also requires considerable modification. For further information on the recent history of the chemistry of the bile we must refer to the works of Leylb and Wollweber. The following description of the microscopic and chemical character of healthy human bile is condensed from a series of papers on the subject by Freerick (Annales, 1845, 2, 17-27; Day's 'Reports on the Progress of Animal Chemistry,' in Ranking's 'Half-yearly Abstract of the Medical Sciences,' vol. III., and 'On the Size of the Cellular Constituents of the Bile.' The bile is always a deep brown, but when seen in thin layers it has a brownish-yellow tint. It is very fluid, being viscid only in new-born infants. The specific gravity varies from 1.023 to 1.040. On examining with the microscope bile from the gall-bladder, with which, of course, a certain amount of mucus is mixed, there are observed:—1. Transparent or greyish-round vesicles, about the 700th of a line in diameter; they disappear on the addition of alcohol or ether, and are removed by filtration. 2. Conical yellow bodies, about the 140th of a line in length, and about the 300th or 400th of a line in breadth, apparently devoid of nuclei; these are epithelial and resemble those of the Malpighian vesicles of the renal tubules. 3. Irregular dark granules, which disappear on the addition of alcohol or ether.

4. Occasionally minute crystals of choleretic, occurring as colourless rhombic tableaux.

The chemical characters are shown in the following analyses.

<table>
<thead>
<tr>
<th></th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>86-00</td>
<td>85-92</td>
</tr>
<tr>
<td>Solid constituents</td>
<td>14-00</td>
<td>14-08</td>
</tr>
<tr>
<td>Choleate of soda</td>
<td>10-22</td>
<td>9-14</td>
</tr>
<tr>
<td>Choleretic</td>
<td>0-16</td>
<td>0-26</td>
</tr>
<tr>
<td>Margarin and olein</td>
<td>0-32</td>
<td>0-29</td>
</tr>
<tr>
<td>Mucus</td>
<td>2-68</td>
<td>2-68</td>
</tr>
<tr>
<td>Cholesterol</td>
<td>0-00</td>
<td>0-00</td>
</tr>
<tr>
<td>Trichloride of phosphen</td>
<td>0-20</td>
<td>0-25</td>
</tr>
<tr>
<td>Phosphate of lime</td>
<td>0-18</td>
<td>0-28</td>
</tr>
<tr>
<td>Magnesia</td>
<td>0-02</td>
<td>0-04</td>
</tr>
<tr>
<td>Peroxide of iron</td>
<td>traces</td>
<td>traces</td>
</tr>
</tbody>
</table>

Platner has recently succeeded in obtaining cholic acid and choleate of soda in a crystallized form.

The bile is a transparent fluid, intended to remove effete matter from the blood, but that it is a secretion essential to the animal economy, was rendered almost certain by the experiments of Berzelius, Thayer, and Schlösser, which are now confirmed. On the basis of these experiments it is thought that each animal has always a certain quanta of the substance resembling bile, to fix the idea that it is evaporated in this manner. A further proof that the bile is absorbed and not excreted is afforded by an examination, made by Enderlein, of the ash yielded by the contents of the different portions of the intestinal canal of a hare. He found that from the ash of the contents of the duodenum alone effervesced on the addition of an acid, such as the choleate of soda (which yields the characteristic odor of the bile), on the addition of alkali, reaching the jejunum. Schwann has recently established this opinion beyond a doubt, by a series of well-observed experiments on dogs. He tied the ductus choledochus, and at the same time formed a communication to the intestines of the biliary duct, to which the bile escaped externally. His most important conclusions are, 1st, that when the bile does not get into the bowel its absence is generally perceptible in dogs about the third day, by a marked diminution of weight; and, 2ndly, that unless the channel for the conveyance of bile to the duodenum is re-established symptoms of deficient nutrition, wasting, debility, &c. ensue, and death is the ultimate consequence.

The chemistry of the bile remains to be revised; it has been recently made the object of especial study by Blundell, Bernard and Barrow, Misaelis, and Dr. A. D. Thompson, who have obtained very contradictory results.

The work has been recently examined by Simon, Clement, and Dunns. The reader will find a copious account of the chemistry of this secretion in Simon's 'Animal Chemistry,' vol. III., pp. 49-89.

The urine has, since the publication of the work of Ewarz, P. C., been made an object of especial investigation by Leylb. The most important fact that has been discovered is that hippuric acid is, although in small quantity, a constant ingredient of the urine. This urine is a secretion peculiar to the kidney, and depends in a great measure, according to that chemist, on the property that uric and hippuric acids possess of combining with the potash or soda of the alkaline phosphates, and thus forming hippuric acid phosphate, which is excreted. The brief space necessarily allotted to this article has renders it imperative on us to omit the consideration of many points of very high physiological importance.

For further information on the subject we must refer to the proceeding pages we must refer to the following works:

1. On the Structure of Animal Tissues—Henle's 'Allgemeine Anatomie,' the article 'Tissue' (Gewebe) in Wagner's Handwörterbuch der Physiologie; Bever's and Todd's 'Physiological Anatomy and Physiology,' the works of Drs. Carpenter; Goodricke's 'Anatomical and Physiological Observations; the articles 'Muscles, Membrane, ' on Tissue, in Todd's 'Cyclopedia of Anatomy and Physiology,' and Mr. Tome's 'Lectures on Dental Surgery' in the 'Medical Gazette' for 1845-6. The best account in the English language of vegetable tissues is given in Henfrey's 'Structural and Physiological Botany.'

2. On the Chemical Department of this article we must refer to Simon's 'Animal Chemistry'; to Dr. Day's Reports on the Progress of Physiological and Pathological Chemistry, in 'The Half-yearly Abstract of the Medical Sciences;' to Leylb's 'Animal Chemistry,' translated by Gregory; to Mulder's 'Versuch einer Allgemeinen Physiologischen Chemie;' to Lehmann's 'Lehrbuch der Physiologischen Chemie;' and to Lieb's 'Traité de Chimie Pathologique.'

TLEMSEN. ['Algiers, P. C., p. 480.]

TOD, JAMES, Lieutenant-Colonel, in the service of the East India Company, was born in 1792, in England, and educated in Scotland. He went out to India in 1800, and obtained a commission in the 3d Bengal European regiment; thence he volunteered for the Moulmeen, was transferred to the marines, served as a mariner on board the Mornington, and, in 1805, when in the subsidiary force at Gwalior, in Hindostan, was attached, under his friend Mr. Gurney Mercer, to the embassy sent at the close of the Mahratta war to the court of Sindia in Mewar, where the embassy arrived in the spring of 1806. Rajpootana, of which Mewar is one of the states, thenceforward became the scene of his official labours, as well of the geographical, historical, and antiquarian investigations by which he distinguished himself. He made several surveys of Rajpootana soon after his arrival in the country, and the result of those surveys was the magnificent map which is the present at the commencement of his 'History of Rajpootana.' The map was completed in 1815, and was presented to the Marquis of Hastings, then governor-general of India, and it was of great use in forming the plan of operations in 1817, on the previous day, which was imperfect and erroneous. In 1817 he was appointed political agent, with the entire control of five of the states which had then just placed themselves under British protection, Mewar, Marwar, Jessulimur, Kotah, and Boondee. The results of
his investigations into the geography, history, and antiquities of Rajpootana are given in his 'Annals of Rajasthan.' Regarded as the historian of the country, it is necessary that he should return to the more congenial climate of his native country. Previously however to his departure from India, he made a circuit of nearly the whole of Rajpootana, which he completed at the close of 1822, and in the beginning of 1823 he sailed from Bombay, and arrived safely in England.

After his return to England his time was chiefly devoted to literature. He was elected a Fellow of the Royal Asiatic Society. In 1834 he went to the Continent for the relief of a complaint in the chest, and remained abroad twelve months. He returned to England in September, 1835. While he was occupied with 'Travels in Western India,' the result of the journey which he made previous to his return to England, and especially his observations in Gujerat, the last chapters of the work were written in October, 1858, while residing with his mother in Hampshire, and the MS. is said to have been left nearly fit for publication except filling up a few blanks and the completion of the engravings; but it has not yet been published.

On the 16th of November, 1838, while transacting business with his bankers in London, he had an attack of apoplexy, and lay without consciousness for twenty-seven hours. He died November 17, 1838, at the age of fifty-three. He left a widow, the Revd. Mrs. Heber, and a family. Bishop Heber, who travelled through Mewar and the adjoining Rajpoot states, in 1826, on his way to Gujerat, bears testimony to the affection and respect borne to Colonel Tod by the Hindoo inhabitants, and when in various towns through which the bishop passed. He says, 'Here and in our subsequent stages we were continually asked by the cut- wals, &c. after Tod Sahib (Captain Tod), whether his health was better since he returned to England, and whether there was any chance of seeing him again. On being told it was not likely, they all expressed much regret, saying that the country had never known quiet till he came among them, and that they expected either rich or poor, they were all exceedingly dear, loved him. He, in fact, Dr. Smith told me, loved the people of this country, and understood their language and manners in a very unusual degree.'

Bachelors, a commercial town, which had contained 12,000 families, had been entirely ruined by the depredations of the Maharrattas at the time when Colonel Tod was appointed political agent. He set himself to restore it, and in less than a year there were seven hundred prosperous and peaceful families in it. Colonel Tod, in a letter to a friend, says, 'Regarding Bachelors, the work of my hands, in February, 1818, there was not a dog in it; in 1825 I left 8000 houses, of which 1200 were bankers and merchants.

The place was in the hands of the 1st and 2nd Light Dragoons and deserted by his inhabitants, when Captain Tod persuaded the Rana to adopt measures for encouraging the owners of land to return, and foreign merchants to settle. He himself drew up a code of regulations for them, and obtained them an immunity from taxes for a certain number of years, and sent them patterns of different articles of English manufacture for their imitation. He also gave money liberally to the beautifying of their town. In short, as one of the merchants who called on me said, 'It is thought ought to be called Todgurze, but there is no need, for we shall never forget him.'"

The 'Annals of Rajasthan' were published in London, in 2 vols. 1833; in 1834, and in 1838. He was educated at Hertford College, Oxford, where he proceeded M.A. in 1786.

He became a minor canon of Canterbury Cathedral soon after he returned to England. In 1792 he was elected a Fellow of the Royal Society, and in 1793 he was appointed by the Archbishop of York to the prebend of Husthwaite, in that cathedral church; and, finally, in 1832 he was appointed Archdeacon of Cleveland.

His attention was, from the commencement of the Deans of Canterbury, from the new foundation of the Church by Henry VIII., 5 vols., 1793. This was followed by an edition of Milton's 'Masque of Comus,' with notes and illustrations, 1 vol. 1801; 'The History of the Life and Writings of John Milton,' with notes and a life, 6 vols. 1801, for which he received 2000l. from the booksellers, and of which there was a second edition 4 vols. 1806; 'The Poetical Works of John Milton,' with notes and a life, 8 vols. 1806, reprinted in 1846; 'Illustrations of the Lives and Writings of John Gower and Geoffrey Chaucer,' 8 vols., 1810; 'A Catalogue of the Archiæpaliscæ Manuscripœs in the Library at Lambeth Palace,' fol., 1819 (600 copies privately printed); a new edition of Dr. Johnson's 'Dictionary of the English Language,' with corrections and additions, 8 vols. 1814, &c., and again in 3 vols. 1827; 'The History of the College of Bishops, Bishops and Archbishops of Canterbury, for the Earl of Bridgewater'; 'Original Sin, Free Will, Redemption, Faith, Good Works, and Universal Redemption, as maintained in certain Declarations of our Reformers,' &c., 1819; 'Manners and Customs of the Tribes and Translators of the Bible' (in reference to Bellamy's new translation), 8 vols., 1819; 'Observations on the Metrical Version of the Psalms, by Sternhold, Hopkins, and others,' 8 vols., 1821; 'Memorials of the Life and Writings of Bishop Heber, Bishop of Chester,' 3 vols. 1822, 1824, 1825; 'An Account of Greek Manuscripts of the late Professor Carlyle, now at Lambeth,' 6 vols., 1828 (privately printed); a new edition of 'The Doctrine of the Sacrament,' 8 vols., 1826, with a Vindication of Cramer, reprinted in 12mo. in 1826; 'A Letter to the Archbishop of Canterbury, concerning the Authorship of Iden Basili, &c., 1825 (assigning the work to Bishop Gauden); 'A Reply to Dr. Lingard's Vindication of his History of England, as far as respects Archbishop Cramer,' 8 vols., 1827; 'Bishop Gauden the Author of Iden Basili' further shown, in answer to Dr. Wordsworth,' 8 vols., 1829; 'Life of Archbishop Cramer, 2 vols. 1831 (an enlargement of the 'Vindication'); 'Authentic Account of our Authorized Version of the Bible,' 12mo., Malton, 1864. We have only to add that the whole of the papers and portions of literary works here published are in the possession of Mr. Heber, who also, in the early part of his literary career, a frequent contributor to the 'Gentleman's Magazine'; and he is stated in his obituary notice to have been a member of the Kent Philosophical Society, and to have assisted largely in the preparation of that work.

Archdeacon Todd, who was a Chaplain in Ordinary to her Majesty, died at Settrington, on the 24th of December, 1845.

From Hereford he took the direct route which is given in the 'Gentleman's Magazine' for June, 1846, he appears to have left several daughters.

Archdeacon Todd, though the editor of Milton and Spenser, had no pretensions to either poetical talent or poetical taste; but nor was even his acquaintance with our old poetry, or with our old literature in general, very extensive or intimate. His annotations, accordingly, are rather dry. At the same time, if they do not overflow with much variety of knowledge, and rarely display, any remarkable ingenuity, they do not annoy the reader by any kind of superfluous discursion. He is certainly not a very animated narrator; but he facts may generally be found in their proper order, and after the words, perhaps, have been rendered in the field of bibliography.

(Memoir in Gentleman's Magazine for March, 1846.)

TOFIELDIA, a genus of plants belonging to the natural order Compositae, and family of the Asterales, is generally burting longitudinally. The three capsules, connected to above the middle, are 1-celled and many-seeded.

T. patula, the only British species, has pedicles naked at the top, and is a species of T. patula, the flowers are from 4 to 8 inches high, the leaves sword-shaped, about 2 inches long, in 2-ranked radical tufts. The flowers are in a dense spike, at first sessile, afterwards slightly stalked with a bract at the base. It flowers in November, and is native of the perianth.

(Behington, Manual of British Botany.)
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1845, all corporal tenements and hereditaments shall, as regards the conveyance of, be immediately conveyed by the delivery of the deed of conveyance, as incorporeal hereditaments and reversions and remainders of corporal hereditaments are passed, such delivery to every deed to be effectual as a grant, being the same as if the same had been a release founded on a lease for a year, and also with the stamp-duty (exclusive of progressive duty) with which such leases for a year have been chargeable. For and in consideration of the conveyance of a fee simple or any less estate, the only operative word now necessary to be used is 'grant.'

By section 3, a feoffment (unless made under custom by an infant) is to be void unless it be by deed; and a person in possession, and an exchange, or lease required by law to be in writing, an assignment of a chattel interest, a surrender in writing of an interest which could not be made at law without writing, or in any tenements or hereditaments not being copyhold, is to be void at law unless made by deed. The only effect of this section with respect to most of the matters comprised in it, is to assimilate the law to the practice, and with respect to others, to require to be made by deed. The reason of this distinction seems to be that in the feoffment the essential part is not the execution of the deed, but the delivery of the possession or seisin from the foother to the feoffee.

A feufo de男 to have any estate, conveyance, and an exchange or partition is not to imply any condition in law; and the word 'give' or 'grant' is not to imply any covenant in law beyond what it already has under any Act of Parliament, (section 4). This provision points to the old common law doctrines, that a feoffment, though made by a person having no title but possession, had the tortious effect of passing the fee, and that warranty was implied from the use of the technical words 'exchange,' 'give,' and 'grant.' A saving clause has been rendered necessary by the introduction into certain Acts of Parliament containing short forms of conveyance, and providing that, to save expense, the word 'grant' is not to mean any more than is necessary.

By section 5 it is enacted that under an indenture an immediate estate and the benefit of a condition or covenant may be taken, although the taker be not named a party: and a deed purporting to be an indenture is to have the same effect as an indenture, although not indented. This abolishes the distinction between an indenture and a deed-poll, whereby a person in possession is entitled to a fee simple, and under it except by means of the Statute of Uses; whereas any person might take under a deed-poll, which is addressed to all the world. The latter clause of the section merely expresses the intention by which it is enacted.

By sections 6 and 7, contingent interests, possibilities coupled with an interest and rights of entry, whether immediate or future, and vested or contingent, in tenements and hereditaments not being copyhold, are not to be excluded, but no such disposition is to defeat or enlarge an estate tail. These provisions extend to married women, who are likewise enabled to disclaim by deed, but all deeds executed by them must be indented, and no formerly to the parties of the first description. One object of the first of these clauses is to remedy a deficiency in the Act for the Abolition of Fines and Recoveries, which provides for the conveyance of contingent estates both in fee simple and in any other species of contingent estate. Under this clause also the assignee of a right of entry has power to enter for a breach committed before the assignment. The second clause is also intended to remedy an omission in the Fines and Recoveries Act.

By section 8 a contingent remainder existing at any time after the passing of this act, is to be deemed to have been, capable of taking effect notwithstanding the determination by forfeiture, surrender, or merger of any preceding estate of freehold, in the same manner as if it had been created by a previous disposal. As that part of the 7 & 8 Vict. c. 76, relating to contingent remainders, was repealed as from its commencement, it was necessary to provide for those cases in which property had been vested in a contingent remainder before the provisions of the Act are effectuated by making the clause in question relate as well to those contingent remainders existing at any time after 31st December, 1844, as to those created before the passing this act. The force of this clause will be understood by referring
TRANSIT, RAILWAY.

An article intended to be supplementary to that given under RAILWAY, P. C., pp. 245-267, and to treat especially upon matters which have risen into importance during the seven years which have elapsed since that article was written, many topics which seem to claim attention must be passed over, or treated very briefly. Excepting in the simple historical portion of the subject, almost every line that has been referred to presents matter upon which something might be said indicative of the rapid progress of mechanical improvement, or of the results of extended experience; but our attention must be confined to a few only of the more important points relating to railway legislation, and to the construction, working, and management of railways, together with statistical notices of the progress of the railway system in the United Kingdom, France, and other countries, over the whole face of Europe, and of the civilized world. To facilitate reference we shall, as far as the nature of the subject permits, follow the order of arrangement established in the earlier part of the volume, but the reader may readily trace the connection between the original and the supplemental matter. The principal deviations from this course are in the bringing together, under the general head of "finance," the whole matters of the obtaining of railway acts, originally noticed under RAILWAY, pp. 251, 252, and such as relate to government control, taxation, &c., which were noticed in pp. 260, 261 of that article; and in the incidental notice in connection with the important question of gauge, of various matters relating to general principles of railway construction, working, and management.

Railway Legislation.—The growth of Railway travelling in this country has been so sudden, and its consequences, in relation to the interests of the public, were so little foreseen at its commencement, that until very recently it has advanced without control, and, it may be said, almost without the notice of the Government.

There are two opposite principles of administrative policy which may be pursued in reference to undertakings of public utility. By the one all such works are executed either directly by the Government or under Government superintendence; by the other they are the result of private enterprise, and Government has no further concern with them than to see that they are executed by those who have the means necessary for their execution. In countries where capital is not abundant, nor the spirit of commercial enterprise very active, the former principle is often essential for the promotion of public works, and in the case of the railways and canals of France, Belgium, and Germany; but where the speculative energy and resources of capitalists are so remarkable as in England, no encouragement is needed from the Government, and its interference is required only for the protection of public interests. The circumstances of this country, therefore, would naturally have dictated the policy of protecting the investment of capital in public undertakings, with as little restraint as possible; and our free institutions, and the generally passive character of our Government, have favoured politically a principle which would have been considered a dangerous one in the United States. The question may be doubted, indeed, whether this principle has not been carried too far; and whether capital would not have been invested more beneficially under a surer and more provident system of legislation.

The following is a sketch of the proceedings which have been necessary for carrying out a scheme of railway communication. The parties who have planned it obtain subscriptions to the undertaking, and having ascertained the surveys and satisfied themselves of the profitable character of the speculation, they determine to apply for an Act of Parliament to incorporate a company for executing the works, and to give them the powers required for that purpose. The most important power to be obtained is that of taking lands and houses without the consent of the parties interested in them; and in the early period of railway legislation, the only opposition encountered by railway companies was that of the landowners, who were either unwilling to sell their land or dissatisfied with the price which had been offered them. If this opposition was overcome or conciliated, the bill was allowed to pass. If no such opposition was offered, and if there were no competing lines, no means were taken by Parliament to inquire whether the line was the best that could have been suggested to the public; but if the promoters intended to pass; but the evidence adduced by the promoters was held to establish the public utility of the undertaking, and it was authorised. The executive government took no part in the investigation of the several quotes for the public interest; and so little was the character of railway communication understood, that in fixing the tolls and charges, parliament at first named a maximum for the tolls, as in the case of canals, but that idea was afterwards abandoned, and the existence of goods and passengers. As the companies undertook the entire traffic of their own lines, no tolls were payable, and the maximum, which was intended for the security of the public, was wholly ineffectual. This oversight has since been rectified, and every railway act of 1845 and 1846, whether for a new line or for an amendment of acts, under which existing lines were constructed, contains a clause which reserves to Parliament the right of revising the rates and charges; and in most of the recent acts the maximum charges are moderate. In 1838 committees were required to give their opinion on government representations, but their proceedings were improved by this regulation in form rather than in substance. In 1839 the constitution of the committee was improved by the admission of "selected members," who were not interested in the undertaking, and the committees have been composed exclusively of members who have had no local interest in the lines referred to their consideration. But however these tribunals may have been improved, the same system of legislation has practically prevailed. Unopposed lines have, almost without exception, been sanctioned upon the ex-parte evidence of the promoters; and opposed lines have been granted or refused according to the relative wealth, influence or perseverance of the contending parties.

It is undeniable that more vigilance ought to have been exercised in investigating the merits of lines, and in securing the best terms for the public which were consistent with justice and fairness; while, on the other hand, the promoters of railways ought to have been protected against the ruinous waste of capital which has been occasioned by various forms of procedure, and by ill-regulated and too often incompetent tribunals.

But notwithstanding admitted defects in the system of railway legislation, the principle of allowing free scope to the operations of private enterprise and capital has been eminently successful, and more railways have been constructed in the last fifteen years, and more science and enterprise have been displayed in all branches of transport, than a government could have called forth in half a century. Nor have the public interests otherwise suffered so materially as might have been anticipated; for the conditions, for the public good, which might have been made the
subject of express regulation, have in great measure been secured by the operation of the same principle. The charges upon goods and passengers, for example, which might have been expected to have accompanied the track, have shown a considerable tendency to decrease. The competition of canals and steam-boats, the profits to be secured by the encouragement of increased traffic, the dread of competing lines, the example of other lines already constructed, and other circumstances, have already caused a very general reduction of railway charges, and may eventually lead to still more extensive reductions.

This acknowledgment is due to the spirited and able capitalists, who, under a defective system of legislation, and without any aid or direction from the government, have done so much for the prosperity of the country that it has been impossible to overlook many serious evils which have arisen from the want of a uniform administration of railway affairs:—1st. Parliamentary committees, however well conducted, are independent of another, are guided by no uniform principle, have no peculiar experience, and are devoid of all means of obtaining any other information but that which is offered by the parties themselves. 2dly. Great powers are required by companies for executing their works and conducting their business, in granting which considerable caution is necessary. 3rdly. When the acts for incorporating companies have been passed, it is desirable that every railway should have the power and right to send trams from being exceeded, or extended injuriously. The whole traffic of the country is rapidly being absorbed in railway communication, and so enormous a public interest needs the utmost care of the government to guard the public safety and convenience, a quite compatible with a respect for the freedom of capital.

Having stated these general principles in reference to railway legislation, we may proceed to a brief analysis of the views entertained by different railway companies from time to time for the supervision of railways and for other purposes connected with the general administration of railway affairs. The objects for which they were passed are not always analogous, but it will be convenient to offer a consecutive view of them, as, however imperfect they may be, they constitute, in effect, our whole railway code.

The first step towards a control of railways by the government was taken in 1840, when an act was passed to place them under the supervision of the Board of Trade (§ 4 & 5 Vict. c. 97). By this act it was provided, that no railway should be opened until a month's notice had been given to the Board of Trade; that returns should be made by all railway companies of their traffic, of accidents, and of their tolls, rates, and charges; that the Board of Trade should be authorized to appoint inspectors to examine railways; and that all bye-laws should be submitted to the Board, who may disallow them. These and other matters provided for by this act, at once disturbed the independence under which the railway system was growing up, and placed the affairs of all the railways under the immediate supervision, and, in some degree, under the control of government.

By the act 5 & 6 Vict. c. 55, power was given to the Board of Trade to prohibit the opening of any railway not considered safe by their inspectors: notice of accidents attended with serious personal injury was required to be given to that board within forty-eight hours after their occurrence, and the Board were further empowered to direct returns to be made of all accidents, whether attended with personal injury or not. With a view to the public safety, disputes between railway companies having a common terminus, or using a portion of the same line of rails in common, were to be decided by the Board of Trade; and all powers, under existing acts, of making branch communications with railways, and of running locomotive engines upon them, were submitted to their regulation. They were also authorized to enforce the alteration of level crossings which appeared to endanger the public safety.

The provisions required all railway companies to convey Her Majesty's Forces and the Police Force at such prices and upon such conditions as may be contracted for by the secretary at war.

The provisions of these acts were mainly directed to the ensuring of the public safety; but in 1844 a more important act (7 & 8 Vict. c. 85) was passed with a view to secure, as far as possible, the interests of the public from being sacrificed to the privileges granted to railway companies, or from the attempts of railway companies to avoid the payment of due compensation to the property, to companies. With this object the following securities, amongst others, were provided. If after twenty-one years from the passing of the act the construction of any new line of passenger railway the clear annual profits divivable upon the paid-up capital shall have exceeded 10 per cent. upon the average of the three preceding years, the Treasury may revise the scale of tolls and charges, or may require such revision; and if, upon paying to the Treasury 10 per cent.; with a guarantee, however, that 10 per cent shall be made good to the company, and that without their consent no further revision of their charges shall be required for three years. And whatever may be the rate of divisible profits at the expiration of the twenty-one years, the Treasury may purchase any such railway, in the name and on behalf of her Majesty, upon giving three months' notice, and on paying for 25 years' purchase of the annual profits estimated on the average of the three preceding years; subject to arbitration however, in particular cases, and to certain exceptions. And in order to give effect to these provisions full powers are given to examine all the books and accounts of the companies for three years preceding the time at which the tolls may be revised or the railway purchased. For reasons which are well explained in the second report, the Railway Committee of 1846, it is doubtful if these prospective securities will ever be available; but immediate advantages were also secured to travellers and to the government.

In order to provide for the poorer class of travellers the means of travelling by railway at moderate fares, and in carriages protected from the weather, it was enacted that every railway company should provide one third-class passenger train, at the least, all along the line where two or more passengers are carried, and under the following conditions:—

1. The hour of starting to be subject to the approval of the Board of Trade.

2. The speed shall not, upon an average, be less than 18 miles an hour for the whole distance travelled, including stoppages.

3. The train shall, if required, take up and set down passengers at every passenger station.

4. The carriages shall be provided with seats, and protected from the weather in a manner satisfactory to the Board of Trade.

5. The fare of each passenger shall not exceed 1d. a mile.

6. Each passenger shall be allowed to take half a cwt. of luggage, not being merchandise or other articles carried for hire or profit without extra charge; and no excess of luggage is to be charged by weight, at the lowest rate charged for passengers' luggage by other trains.

7. Children under three years of age, accompanying passengers, are to travel without charge, and under twelve years of age, at half price.

With the exception of the fares, which are in no case to be exceeded, the Board of Trade were empowered to dispense with any of these restrictions where they considered the arrangements made by railway companies, which may appear more beneficial and convenient for the passengers by the cheap trains. And as an encouragement to cheap trains, it was further provided that there should be levied by each railway company, which arise from the conveyance of passengers at fares not exceeding a penny a mile.

If any passenger train shall run on Sundays on any railway, subject to the above provisions, it is required that a sufficient number of third-class carriages shall be attached to the train which stops at the greatest number of stations, and that the passengers shall be carried, as in the cheap trains, at fares not exceeding a penny a mile. By the act 5 & 6 Vict. c. 79, the duty upon passengers conveyed by railway is chargeable at the rate of 5 per cent. upon all sums received or charged for the hire, fare, or conveyance of such passengers, was 21,826l. (Parliamentary Paper, 1846, No. 606.)

By an act of the 1 & 2 Vict. c. 98 provision had been made for securing advantageous arrangements upon railways for the conveyance of mails, and by this act additional facilities were given for that purpose.

In regard to new railways also, a further provision was introduced in respect to the conveyance of troops, requiring the privilege of occupying railways of the Parliament, in time of war, on duty to be conveyed in a first-class carriage at fares not exceeding 1d. a mile, and every soldier or policeman, and their wives, widows, and children above twelve years of age, in a carriage provided with seats, and protected from the weather, at 1d. a mile;
children under three years being taken without charge, and under twelve at half price, as in the case of the cheap trains. The company are required to convey military stores, baggage, and troops, by facilities for the employment of the military being given in loading and unloading them; and gunpowder and other combustible matters at such prices and under such conditions as may be contracted for with the secretary. It was also enacted that every railway shall be bound to allow a line of electric telegraph to be laid down for her Majesty's service upon lands adjoining the railway, and to give every facility for erecting and maintaining it; and such telegraphs being erected, to such reasonable remuneration as may be agreed upon, or, in case of disagreement, as may be settled by arbitration. Such telegraphs, subject to the prior use of the government, may be used by the company for the purposes of the railway, upon terms to be agreed upon or settled by arbitration. And where an electric telegraph shall have been established by the railway company, or by any company or person, otherwise than exclusively for the public service, or exclusively for the purposes of the railway, or jointly for both, the use of it, for the purpose of receiving and sending messages, shall be open to all persons alike, without favour or prejudice; but subject to priority of use of government and the railway company, and to such equal charges and reasonable regulations as may, from time to time, be made by the company.

The direction of the lines of railway has been given to the Board of Trade to appoint persons to inspect railways, and by this act the board were empowered to appoint permanent inspectors, not only to inspect railways, but also to enable the Board of Trade to provide for the protection and preservation of the railway acts. This enactment resulted in the nomination of the Railway Department of the Board of Trade, of whose functions and proceedings we shall presently have to speak. Whenever it shall appear to the Board of Trade that the provisions of any acts for the regulation of railways have not been complied with, or that the companies have been acting in a manner unauthorised by such acts, or ought to be re-promulgated or stringent, the Board of Trade shall certify the same to the Attorney-General for England or Ireland or to the Lord-Advocate of Scotland; who shall proceed against such companies at law or in equity, as the case may require.

A practice had arisen of issuing loan notes not authorised by the acts under which railway companies were empowered to borrow, and by this act the issue of such notes in future was prohibited, but validity was given to those which had been already issued, and companies were authorised to renew them for five years after the passing of the act. A register of such loan notes was, at the same time, required to be kept by the secretary of the company.

A remedy was also provided for the speedy recovery of tithe-rent charges payable upon lands which had been taken for railways.

The experience of railway companies who had applied to parliament, from time to time, for powers to make and maintain their lines had suggested various clauses which were usually adopted in all railway bills. These were very numerous, and in some cases contained provisions which obtained an act to authorise its own separate undertaking. These powers, though generally very similar in all cases, were sometimes varied by the parties applying for acts, and such variations were sanctioned by parliament. In this matter not only was a want of uniformity occasioned in the powers given to parties engaged in precisely similar undertakings; but all these important provisions were contained in local acts. Little known was the partial proclamation of another inconvenience of less consequence, arising from this system of legislation, was the necessity of repealing in every railway act the related multitudinous enactments.

To remedy these inconveniences several acts were passed in the session of 1845, which are now commonly called the 'Consolidation Acts.' The first is the 'Companies' Clauses Consolidation Act, 1845 (8 & 9 Vict. c. 100), thereby consolidating all the provisions which had usually been inserted in acts with respect to the constitution of companies incorporated for carrying on undertakings of a public nature. This act is not peculiar to railway acts alone, but which apply to parliament for incorporation, and which require the powers contained in it. It regulates the distribution of the capital into shares, the registry of shareholders, the transfer of shares, the power of the company to borrow money, their general meetings, the votes of the shareholders, the appointment and rotation of directors, their powers and proceedings, the appointment and duties of auditors, the accountability of the officers of the company, the form of books of accounts to be kept, the declaration of the settlement of disputes by arbitration, the service of notices upon the company and by the company upon shareholders, and the recovery of damages and penalties. By a similar act (c. 17), provisions of a like nature have been enacted with reference to the taking of lands for undertakings of a public nature. It provides for the purchase of lands by agreement, for the compulsory purchase of lands and the assessment of their value, for the form of conveyances, the entry upon the lands of the promoters of the undertaking, and for dealing with the various interests in land, as copyholds, common lands, mortgages, rent-charges, leases, &c. A similar act for the same purpose was passed for Scotland (c. 18). These acts are also applicable not only to railways but to all other undertakings in which compulsory powers of taking land are necessary.

The last act of the series is the 'Railways Clauses Consolidation Act' (c. 20), which consolidates all the usual provisions of previous railway acts, which relate generally to the construction and maintenance of roads, the drainage of lands affected by the railway, the temporary occupation of land during the progress of the works, the crossing of roads, the construction of bridges, and the works required to preserve the peace and quiet of the surrounding districts. It regulates the traffic in goods and passengers on the line, and prescribes the use of suitable carriages and engines.

These acts did not affect the provisions of local acts which had been passed before the session of 1845; but the acts of that session and all subsequent acts have simply adopted the three consolidation acts without repeating them, and where any special powers not contained in these acts are sought for by the parties, they are contained in distinct clauses, which are obvious variations from the ordinary law.

In the same year it was observed that various railway acts of that session had given to companies general powers of granting or accepting leases, sales, or transfers, of their own or other lines of railway; and as the exercise of such powers without control was regarded with jealousy, as being liable to lead to an amalgamation of lines, for which separate acts have been passed, without the distinct authority of parliament being obtained, in each case; an Act (8 & 9 Vict., c. 96) was passed, declaring that no such sale, lease, or transfer, should be lawful, unless under the authority of a distinct provision in some act of parliament, to that effect, specifying by name the railway to be leased, sold, or transferred, and the company or party by whom such lease, &c., may be made, granted, or accepted.

Another act must here be referred to in connexion with railways. The 'Joint Stock Companies' Act of 1844 (7 & 8 Vict., c. 110), though applying generally to another class of companies, provided that names of companies relating to railways. Before the passing of this act, it was only necessary for railway companies to comply with the standing orders of both Houses of Parliament before they applied for a bill to authorise the undertaking; but other conditions must now be complied with. Before the promoters of a railway may publish any prospectus, handbill or advertisement, they must return to the Registrar of Joint Stock Companies, 1st, the proposed name of the company; 2nd, its business or purpose; and 3rd, the names, occupations, &c., of the promoters; and either before or after the prospectus is published, they must return their provisional place of business, the names of the committee, &c., with a written consent of each promoter to become such, and an agreement to take one or more shares; the names, residence, &c., of the officers of the company; and a copy of the prospectus itself before it is circulated or made public. When the three first particulars, at least, are complied with, the promoters are entitled to receive a certificate of provisional registration.

The promoters may then assume the name of the proposed company ' provisionally registered,' and may open subscription lists, and allot shares and receive deposits not exceeding the nominal value of the shares to be issued, for each 10s., 1l., or other share capital as may be required by the standing orders, and may perform all the acts necessary for obtaining an act of parliament.
In order to obtain a certificate of complete registration, the company must send to the register a copy of the 'Parliamentary Contract,' and the 'Subscribers' Agreement,' together with certificates of the deposit, at the proper offices, of the money required by the act, conditioned with the payment of the interest and the redemption of the deposit. When the certificate has been obtained, the promoters may use the name of the company 'registered,' may have a common seal, may sue and be sued in their registered name, and may enter into contracts, conditionally upon the passing of the act, for the execution of works, for the supply of stores, or for any other necessary purpose of the company.

Subject to these conditions the companies must comply with the standing orders of both Houses of Parliament. The committee of the House of Commons, and apply for bills to incorporate them and authorise their undertakings.

In the session of 1846 several acts were passed affecting railways. The first (9 & 10 Vict. c. 20) introduced an improved method of effecting the deposits of moneys required by the standing orders of Parliament, to be deposited by the subscribers to undertakings; and granting the privilege of depositing Exchequer Bills and other public securities instead of money. This act was rendered necessary on account of the great inconvenience sustained by the promoters of railway bills and by the public, from large sums of money being suddenly withdrawn from the money market which were locked up unprofitably in the hands of the accountant-general of the Court of Chancery, and were not very readily invested in government securities.

The second (9 & 10 Vict. c. 29) facilitated the dissolution of railway companies which had not on the 3rd of July, 1846, obtained acts of parliament to authorise their undertakings, and placed the form and proceedings under which such dissolution should be effected.

The third is an act for constituting Commissioners of Railways, which transfers to the commissioners to be appointed all the powers and duties of the Railway Department of the Board of Trade. The commission is to consist of a president, with a salary of 2000l. a year, two paid commissioners, with salaries of 500l. each, and two unpaid commissioners. The president and the two paid commissioners will be qualified to sit in Parliament; but the two paid commissioners will be disqualified.

In addition to the ordinary powers of the Railway Department they are to examine and report upon any subject relating to any railway or proposed railway, which shall be specially referred to them for their opinion, by Her Majesty or by either House of Parliament. And authority is given them, for that purpose, to inspect and survey any proposed line of railway, with all the powers possessed by the officers engaged in the Ordnance Survey, and to charge the expenses to the promoters.

These are the several statutes relating to railways; and a few remarks will be sufficient to explain their general operation and the proceedings which have been adopted for carrying into effect their provisions. It has already been stated that, by virtue of the act of 1844, the Railway Department of the Board of Trade was constituted. Its general object was to enforce the provisions of that and other acts, and to report to Parliament its own proceedings, the progress of railway communication, the accidents which occurred, and other matters which come within its cognizance. Its functions were originally confined therefore to the general supervision of railways already authorised by Parliament; and although railway bills were then sent to the Board, it was not the doctrine of the Board took no active or ostensible part in reference to railway schemes about to be submitted to parliamentary investigation; but in consequence of the recommendations of a select committee of the House of Commons in 1844, the Board was instructed by the Lords of the Committee of Privy Council for Trade to undertake a preliminary examination of all railway schemes, to publish their decisions in the 'London Gazette,' and subsequently to submit detailed reports for the information of Parliament. This plan of investigating railway schemes, which was perhaps a departure from the preceding practice, was not without its difficulties. It had been tried in the case of the four competing lines to Brighton in 1836; and in respect of the communication between London, Dublin, Edinburgh and Glasgow, and more extensively in regard to the railway communication of Ireland, in 1837; but this was the first experiment that had been made of a systematic investigation of all railway schemes by a government department, in anticipation of the formal examination of the scheme by the House of Commons. The committee of the Board of Trade, in their views, lay down the general principles upon which they intended to proceed, but they had not anticipated the positive manner in which the House of Commons would be likely to receive their proposals. The committee of the Board of Trade was dissolved by a resolution of the Commons, and the railway bill was referred to a select committee of the House of Commons, who proceeded with the investigation of the several bills very much in the same manner as if no reports had been made by the Board of Trade, and their guidance. The decisions of the Board of Trade may have been influenced by the reports of the Board, but the reports themselves, though ably written and often of the highest value, were not founded upon a public examination of the facts. The Board of Trade was a body of men who had that account did not obtain such confidence as to be held conclusive, when interests of such magnitude were concerned.

And it may be doubted whether, under any circumstances, any body which is so strong and irresponsible than parliament itself, could at that time have withstood the manifold influences of railway companies and speculators. At all events this experiment of the railway department was admitted to be a failure, and by a statute of 1845, it was abolished. The Privy Council for Trade, of the 10th of July, 1845, the Board has since directed its attention to questions affecting the public safety and to considerations of public utility, but has in no case pronounced an opinion on the actual or comparative merits of any railway schemes. During the whole of the session of 1846 there was an unprecedented pressure of railway business before parliament, but without any aid from the government it was disposed of, in the usual manner, by committees. It has been stated that all the powers of the Railway Department of the Board of Trade have been transferred, by Act of Parliament, to the Board of Trade; and it is most probable that the experiment of reporting upon the merits of railway schemes, which failed before, may now be revived; but under the act it will be confined to such cases as may come under the consideration of the Board of Trade or the House of Parliament. The difficulty which existed before in giving to the degree of authority which preliminary inquiries and reports should possess still remains, it is feared, as great as ever. The power of the Board has been greatly increased; and as conclusive of the matters referred to their consideration, the intolerable evil will exist of three distinct investigations before three tribunals, and at an enormous expense to the promoters of railways. The decisions of the commissioners may be reversed by the Commons, whose decisions again may not meet with the concurrence of the Lords; and thus after three inquiries a bill may be lost at last. The only mode of avoiding this evil, which was produced by the system of exhaustive preliminary inquiries, is to refer questions of fact to the investigation of the commissioners, and to hold their reports as final in all cases. It will be necessary, also, that their inquiries shall be of a more public and judicial character, in order to secure public confidence.

Principles of Design and Construction.—Under that division of the article Railway there is a consideration of what is considered as the character of the designing of a railway, it is shown that the tendency of experience was rather to lead to economy in the original cost of railway works by the adoption of comparatively steep gradients, than to the expense of using the most easy route, and to the obtaining of a very level road. In the new railway schemes which acts have been obtained since 1840 the result of the modified opinions of engineers upon this point is apparent in the fact that in 1844, 1 in 100, 1 in 120, and 1 in 150, 1 in 100, and, in several cases, of still steeper slopes, which, by
allowing a nearer adherence to the natural surface, leads to considerable saving of expense in comparatively easy countries, while it allows the conducting of railways in many cases through districts which, a few years since, would have been deemed utterly impracticable for manual labor. The North British and Caledonian railways, passing through a mountainous country where, notwithstanding the introduction of gigantic engineering works to improve the gradients, several long and steep slopes occur, are exactly fitted to it. In this line, especially very formidable slopes were found inevitable, those between Beattock and the summit of the Clyde pass, a distance of nearly 14 miles, averaging in 1 in 97, and comprising an ascent of 1 in 65. In the same district, another example is given, on a smaller scale, in which experience has proved that with engines of suitable construction, a line with an average rise of 1 in 100 for upwards of 4 miles, part of which has a slope of 1 in 80, and which, owing to the peculiarly difficult nature of the country, forms a continuous series of curves of smaller radius than is usual upon locomotive lines, may be worked in both directions with speed, safety, and regularity.

In the Report of the Railway Department of the Board of Trade in 1845 upon projected railways in the Manchester and Leeds district many cases are cited in proof of the assertion that such gradients as were formerly thought objectionable are now adopted every day as a matter of course; and as the capabilities of the locomotive have been enlarged, gradients of a class which would have been considered a few years since as impossible, have been successfully carried even in the Great Western railway. Among the cases cited are the inclined planes on the London and Birmingham Railway, from the Euston Square station to Camden Town, raising in 1 in 59 for 1000 yards and 1 in 49 for 640 yards; and that by which the Edinburgh and Glasgow Railway is conducted into Glasgow, with a slope of 1 in 42 for a distance of 1 kilometer; in all of which the use of stationary engines and ropes had been either wholly or in a great measure discontinued, it being found that the trains could be worked successfully under the circumstances and without expense, as required by locomotive engines. The Lickory incline, on the Birmingham and Gloucester Railway, is likewise referred to as a conclusive proof that a gradient of 1 in 374 for a length of 2 miles 3 chains may be worked by the aid of an engine constructed for the purpose, without serious inconvenience to an extensive traffic; and as a proof that such an incline may be descended without danger by the force of gravity, regulated by the action of brakes.

In reference to curves it is observed in the same Report that practical experience has led to a similar modification of the views formerly entertained. 'The Newcastle and Carlisle Railway,' observes the Report, 'presided to the necessity of constructing some succession of curves, of every degree of curvature, up to 8 chains radius, and with steep inclines, being worked with economy and safety, and upon transverse sections by which the entire gravity was afforded for comparing the two planes; and the evidence of Mr. Gray, who was formerly locomotive superintendent upon that line, shows a decided preference for the cross-sleepers. Mr. Gray observed that with the old sleeper, 'I have,' says Mr. Gray, 'seen the engine going out almost as clean as a new pin, and before half an hour had elapsed you could scarcely see a clean spot on it.' He further states that, having been told by an engine-driver that his wheels slipped more upon the longitudinal timbers than upon the cross-sleepers, he, though incredulous, tried it himself one frosty morning, and found that after the engine, slipping so much upon a level part of the road which was laid upon longitudinal timbers as to lead him to fear that the train would be unable to ascend an incline of 16 feet per mile which it was on the point of being required to do, that the train, laid with cross-sleepers, that the slipping stopped, and the engine 'went up like an arrow.' The slipping re-commenced on reaching another portion of road laid on longitudinal timbers, and again stopped on reaching the cross-sleepers. Upon the Croydon railway, which was originally laid with longitudi-
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equally against the jaw of the chair, the middle web of the rail, and its position must be adjusted at the time we write (November, 1845), heavy bridge rails, laid upon cross-sleepers, have been employed.
The kind of rail now most commonly employed resembles that which is stated in the first paragraph of the article on RAILWAY, P. C., which is variously called the I, the II, and the double-T-rail; and the weight is seldom less than 70 or 75 lbs. per yard. In some cases heavier rails have been used; the heaviest used, we believe, being 90 lbs. per yard. Those laid on the Great Southern and Western (of Ireland) Railway, between Dublin and Carlow, by Sir John Macnelli, weigh 90 lbs. to the yard. These rails however are laid in a peculiar method of Macnelli's invention, which was first tried on the Dublin and Drogheda Railway, and in which the use of cast-metal chairs, keys, and pins is avoided, the rails being connected with the sleepers in a more direct and simple manner, which is stated to be highly favourable to security and smoothness of motion.

While longitudinal bearings of timber have lost favour, transverse wooden sleepers, which were formerly regarded rather as temporary substitutes for stone blocks upon embankments and places where sinking might be expected, than as a permanent means of support for the rails, have been brought into very extensive use, and are considered by many to afford the best kind of foundation. The ease with which they are laid, the comparatively small depth of ballast which they require, and their efficiency in keeping the line in gauge, or preserving the direction of the rails, in the event of a change in the level of the material to the fact that the permanent way of the South Eastern Railway, laid under the superintendence of Mr. William Cubitt, is an excellent example of the cross-sleeper construction, which has been exhibited in relaying the Croydon line, and upon some other railways. A minute account of this permanent way, published by Mr. Pope to the Institution of Civil Engineers, in his 'Civil Engineer's and Architect's Journal,' for June, 1842, pp. 290-292, which, as well as a shorter notice in the 'Railway Chronicle' for 1846, p. 299, is illustrated by engravings of the mechanical details. The most striking feature of this construction is the use of sleepers of a regular triangular section, 9 feet long, 11½ inches broad, and 7 inches deep, formed by sawing square blocks of Baltic fig horizontally into four pieces. These are laid with the broadest flat surface (the base of the triangle) uppermost, and the double slope of the under side constituting a form admirably adapted for bedding itself well in the ballast. The chairs, or supports, are produced, cast by Messrs. Ramspeck and May, of Ipswich, of a shape well devised for ensuring sound casting, and obtaining the greatest strength from a given weight of iron, and have a single projecting rib or butting edge, on either side, to engage one of the cast-iron pins. The objective points of support are secured to the sleeper by two pins, one at each end, the holes to receive them being formed alternately on opposite sides of the medial line, so that in a line or tram of the pins may have the least possible tendency to split the sleeper. The joint-chairs, however, or those which are used at the junction of two lengths of rail, have three instead of two holes to receive the fastening pins, which are trent of compressed oak, 6 inches long, and tapering from 1¼ inch to 1½ inch in diameter. The cavity in the chair is so contrived that the rail shall only touch it at two points, the base and the top, at the cheek or jaw, in order that the true angle of obliquity of the rail, and its straightness in the chair, may not be affected by any trifling irregularity of shape; and the rails are secured in place by the pressure of compressed oak, 6 inches long, from each side of the chair. The joint-chair, or section, is placed at a distance of 2 feet 6 inches to 2 feet 9 inches, while the intermediate space is divided into three equal parts. Upon the Croydon line rails of 76 lbs. to the yard, the ordinary chairs 20 lbs. each, and the joint-chairs 26 lbs.; and the chairs and sleepers are placed at an average distance of 3 feet from each other. The gauge of the South Eastern line the rails weigh 70 lbs. per yard, the ordinary chairs 20 lbs. each, and the joint-chairs 28 lbs.; and the chairs and sleepers are spaced at an average distance of 3 feet 6 inches from each other. Upon the South Eastern line the rails weigh 70 lbs. per yard, the ordinary chairs 20 lbs. each, and the joint-chairs 28 lbs.; and the chairs and sleepers are spaced at an average distance of 3 feet 6 inches from each other. Upon the South Eastern line the chairs are placed at a distance of 3 feet 6 inches to 3 feet 9 inches, while the intermediate space is divided into three equal parts. Upon the Croydon line rails of 76 lbs. to the yard, the ordinary chairs 20 lbs. each, and the joint-chairs 26 lbs.; and the chairs and sleepers are placed at an average distance of 3 feet from each other. The gauge of the South Eastern line the rails weigh 70 lbs. per yard, the ordinary chairs 20 lbs. each, and the joint-chairs 28 lbs.; and the chairs and sleepers are spaced at an average distance of 3 feet 6 inches from each other.

In a communication made by Mr. W. H. Barlow to the Institution of Civil Engineers on the 1st January, 1846, and reported in the 'Athenæum' for that year, p. 73, a kind of hollow or tubular key of wrought-iron made to press
progress of the works some of the shareholders became dissatisfied with the increased expenditure involved in the adoption of this greatly enlarged gauge, and at length, in 1869, Mr. F. C. S. proposed that the wider gauge might be adopted. The experiments were carried on in the Great Western line, which was then completed as far as Maidenhead, especially in reference to the new gauge. The results of these experiments were then reported, and there is little difference of opinion among the engineers that the wide gauge, like the lines, would lead to any change in this particular, and consequently the construction of the Great Western line, with its extensions, was continued. In 1870, however, the Cheltenham and Great Western Union line, was completed upon the 7 feet gauge. In the mean time the Eastern Counties railway, another line which was then expected to continue in the Thames valley, was laid with a gauge of 5 feet, which was necessarily followed in the laying of the Northern and Eastern line, after it had been determined to connect it with the Eastern Counties at Stratford. When, however, in 1844, the Eastern Counties company, with which the Northern and Eastern was then amalgamated, obtained powers for extensions which would eventually bring their lines into connexion with the existing lines towards the North of England, the evil of diversity was stopped before any practical inconvenience arose from it, by the expedient of running all trains to and from London upon the national standard of 4 feet 8½ inches; an alteration which, though involving also the modification of all the engines and carriages, was effectuated without stopping the traffic. In the same year, 1844, a branch was opened from the same railway, the Bristol and Gloucester railway, which was originally projected as a narrow-gauge line in extension of the Birmingham and Gloucester, but which, through the influence of the Great Western company, had been laid down on the broad gauge, was opened, and then, for the first time, the evils which had been predicted as likely to arise whenever a break of gauge, or point of meeting between two different gauges should occur, were actually experienced. 

The evidence of the effects of the narrow-gauge system is perhaps most strong where the transfer of luggage of an entire train of much extent, must even in the day-time be an inconvenience of a very serious nature; but at night it would be an intolerable evil: and we think legislative interference is called for to prevent or mitigate such an evil. 

With respect to goods trains also, the evidence of carriers was very decisive as to the evils attendant on any such disturbance and re-packaging as must take place in transferring from one set of tracks to another. Under present circumstances very little re-arrangement of goods takes place in the course of the journey, and even at the important station at Birmingham five-sixths of the goods wagons pass without re-arrangement. In the conveyance of minerals the inevitable expense of the transfer from one set of wagons to another would, without taking into account other considerations, seriously affect the cost of transmission; and the difficulty of shifting cattle would be so great as to present an insuperable obstacle to such an arrangement, from the excited state of the animals after travelling by railway, and the resistance they in consequence offer when it is brought to bear upon them. In reference also to the conveyance of troops the interruption would cause much confusion and delay, requiring, as indeed it does to meet the more ordinary contingencies of general service, a much larger number of engine engines, than the carriers of one company can run over the lines of another.

With regard to the means suggested for remedying or mitigating the evils of breaking gauge, the commissioners express a very decided opinion against the safety of telescopic axles, or couplings by which the wheels of one carriage, or of a whole train, might be shifted at pleasure to suit different gauges, on account of the inevitable danger, to say nothing of the increased expense attending any such mechanism. They also reject as entirely inapplicable to the traffic of railways, the proposal to convey narrow-gauge carriages upon the broad-gauge lines by mounting them upon trucks, an arrangement which could only meet the difficulty as regards a certain portion of the traffic, and that by the conveyance of a large number of engine engines, which required weight and danger. The plan of using shifting bodies for passenger-carriages, capable of being removed from one carriage-frame to another, although practised to a limited extent in France and other countries in which roads are narrow and partly upon a common road, is open to serious objections on the score of insecurity and inconvenience, and it is not expected that the system will be retained in France for long. Of carriage-frames which run in line, and are partly upon a common road, is open to serious objections on the score of insecurity and inconvenience, and it is not expected that the system will be retained in France for long. Of carriage-frames which run in line, and are partly upon a common road, is open to serious objections on the score of insecurity and inconvenience, and it is not expected that the system will be retained in France for long.
sum up their conclusions upon this head by stating their belief that no method had been proposed to them 'which is calculated to remedy in any important degree the inconvenience attending a break of gauge.' In the absence of any evidence of uniformity of gauge throughout the country, the commissioners express their conviction that the time has arrived when, if steps cannot be taken to remove the existing evil of diversity, it appears at least possible the wise measures to prevent it. The question, as applied to the existing state of things in this country, involves, they observe, not only the consideration of the relative length of the lines laid on the two gauges, which, as pointed out by Mr. Wyndham Harding, to enable both engines and carriages to run upon the same line, a plan attended with several difficulties, but which is expected to be adopted in some places where, under present arrangements, the two gauges will intermingle. The difficulty of keeping such a double-gauge road in repair would be serious, and the complication introduced at points and crossings would be very likely to lead to occasional accidents. It is done in the cheapest way, by the addition of a third rail only, carriages of both gauges could not be safely used in one train, because the centre of traction would not be the same, while if mixed engines were used the engine of the narrow gauge would stop short of the line and the complication would be still further increased. This point was illustrated in the evidence of Mr. Wyndham Harding, who showed by a diagram that while at a junction between two lines of ordinary gauge, with two trains running on each, there are only six crossings or intersections of the rails, the number is increased by the addition of two supplementary rails to each track, to twenty-eight. It was further pointed out in the evidence that great inconvenience would attend the use of carriages of different widths on the same line from the circumstance that the station-platforms made to suit the broad would be too far off from the narrow carriages. With regard to the several commendations in connexion with the suggested, enforcement of uniformity, as to what is the best gauge, the commissioners discuss first the question of comparative safety, to which we shall have occasion to advert hereafter, and respecting which they report 'as regards the safety of the passengers no preference is due, with well-proportioned engines, to either gauge, except perhaps at very high velocities, when they think a preference would be due to the broad gauge.' As regards the relative accommodation and convenience for passengers and goods, they consider that the narrow-gauge carriages affording seats for three persons, and giving a first-class, and for four persons, and for the carriage of goods, are rather preferable to the broad-gauge vehicles, which contain only four and six persons respectively in similar cases, because passengers usually like to sit where they can look out, and passengers, the commissioners state, were not likely to take the longer journey by the broad gauge if it were near the latter, even if of equal length, would be the less costly, as well as the less difficult operation. The question of an intermediate gauge is treated very briefly by the commissioners, who, having seen some broad gauge carriages by a partition in the middle, by which the large compartments for eight passengers each are subdivided into two for four each. Until lately the broad-gauge carriages were, they report, 'altogether more commodious than those of the narrow-gauge; but recently carriages have been introduced on several of the narrow-gauge lines nearly as lofty as those on the broad-gauge, and equally commodious.' The evidence as to the comparative ease and smoothness of the motion, which is affected by many other circumstances than the width of gauge, was very contradictory; but upon the whole the commissioners believed, from personal observation on the question, and from the reports of those who have had the most opportunity of comparison, that the smoothness was considerably greater on the broad gauge. For merchandise and mineral traffic the chief bearing of the evidence is in favour of the narrow-gauge small waggon being generally preferred for merchandise of a few hundredweight, in which it is frequently necessary to send wagons partially laden; and also for the conveyance of goods which are liable to injury from pressure. In both kinds of traffic the small vehicles (comparatively small, we should say, the ordinary narrow-gauge waggon being much larger than those used on common roads) appear to be found most convenient and economical. Witness several districts especially, that a smaller waggon can be more easily handled and can be taken along sharper curves than would be suited to a broader waggon; and are therefore more suitable where, as is often the case in such districts, the broken nature of the ground renders curves of large radius inconvenient and expensive. On the whole the commissioners consider the narrow gauge as the more convenient for the merchandise of the country. The observations relating to comparative speed may be passed over with little weight, as the question turns on the relative line the speed both of ordinary and express trains is somewhat greater than upon other lines, the excellence of the gradients, and some other circumstances independent of gauge, the possibility of double-tracking many of the main lines, and the prospective improvements in locomotive engines, analogy would confirm the claim of the advocates of the broad gauge to the power of increasing their speed beyond its present limit, it is not a probable belief that the number of railways would justify the attempting of a higher rate of speed than has been shown to be possible even upon the narrow gauge. In regard to the question of comparative economy the commissioners show that the cost for land, earth-works, masonry, permanent-way, turn-tables, &c., must be greater on the wide than the narrow gauge; that the cost of maintenance must also be somewhat greater; and that the first outlay for engines and carriages is affected in like way by the increase of width. How far this is compensated by the increased power of the engines and capacity of the carriages it is very difficult to ascertain; for in comparing estimates of working expenses obtained from different companies, the circumstances are found to be so different as to render it impossible to deduce satisfactory information with strict reference to the economy of the gauges. By calculations based upon the same data further, they would be led to the conclusion that the average of the cost of the commissioners come to the conclusion that the traffic of the Great Western Railway might, if these lines were altered to the narrow gauge, be worked at about the same expense for the conveyance of goods and for circulating stock, as is the case with the greater trunk-lines of railway, such as are now in practical operation, a superiority due to the broad-gauge system, that superiority would be less for lines yet to be constructed at a small amount of traffic; so that 'the preference were given to the narrow gauge for the existing lines, that system would be still more entitled to the preference for the railways of smaller traffic to which we look forward.' After this, as one of the several important matters, the commissioners observe that, 'estimating the importance of the highest speed of express trains for the accommodation of a comparatively small number of persons, however desirable that may be to them, as far less moment than that of affording increased convenience to the general commercial traffic,' they consider the narrow gauge preferable for public convenience, and, were it imperative in their opinion, would recommend the alteration of the broad to the narrow gauge especially taking into consideration that the extent of the former at present in work is only 374 miles, while that of the latter is 502; the matter is thus reduced to a question of relative cost. The principal question, the commissioners state, is the efficiency of the 4 feet 8 inches gauge, upon both English and Continental railways, was such as to counterbalance any theoretical advantage to be derived from a costly alteration to a gauge of 5 feet, 5 feet 3 inches (which, upon the recommendation of the Board of Trade, had been previously determined as the national or standard gauge for Irish railways), 5 feet 6 inches, or 6 feet, which latter is the largest dimension now adopted by any not directly interested in the 7-feet gauge. They computed that the total expense of altering the then existing broad-gauge lines to the narrow gauge, including the alteration or substitution of locomotives and carrying stock, would cost 'a sum which, however vast, would be lost if the money could not be made to return upon the capital expended.' They neither recommend such an alteration at the public expense, nor conceive that the broad-gauge companies could be fairly required to make it at their own cost, they do recommend to the House of Commons that the subject be referred to the Public Works Committee, with the request that the proportion of cost to be made by the companies and the public be ascertained, and any means be taken to complete the general change of narrow gauge communication from the north of England to the south of Ireland. The commissioners state that the carrying gauge at the junctions to be formed by new lines if laid, as follows: *

* These figures are taken from a return made by the Board of Trade, and are to be corrected, to the 31st of July, 1849. If the openings which have taken place since that time were added, the whole would appear much greater.
on the narrow gauge, with the existing broad-gauge railways, some equitable means should be found of either producing entirely uniformity by the construction of one broad-gauge line, or of adopting such measures as shall admit of the narrow-gauge carriages passing without interruption or damage along them.

The appearance of this report was speedily followed by the publication of the proceedings of the large meeting called, and by the most strenuous efforts on the part of those interested in the broad gauge, to reverse or modify the recommendations of the commissioners, which, it was contended, were drawn up under the influence of three of the commissioners, 'issued' by the broad-gauge party as a kind of counter report, would, if adopted, 'inevitably terminate all chance of future improvements in railway travelling,' by arresting the progress of that company. Several of the companies to which we are undoubtedly indebted for recent achievements in speed, and from which it is pleaded much further advantage may be derived. The report was handed over to the Board of Trade for their consideration, and at a later period of the session of 1846 a bill was introduced, which subsequently became law, founded upon their suggestions. Admitting the general conclusions of the commissioners, the Board appears to have deemed the attainment of uniformity impracticable; and the act for the regulation of gauge therefore simply provides for uniformity upon such new lines as are not directly connected with the existing broad-gauge lines. On the broad gauge, under the acts of 1845, to Rugby and Wolverhampton, and into South Wales; and also in the country lying to the south and west of the Great Western and its extensions limited by the use of railways extending branches of a few miles in length from the Great Western railway, and to such other cases as may be specially sanctioned by parliament. Under the operation of this act, the Birmingham and Oxford Junction line, although projected as an extension of the broad-gauge system, must be laid upon the narrow gauge, unless, as its promoters anticipate, powers for adopting the wide gauge can be obtained in a future session. It is felt by many who have studied the subject, that this compromising arrangement must be regarded merely as a temporary adjustment of the difficulty, and that increased experience will convince even the propriety of the broad-gauge lines of the necessity, for the promotion of their own interests as well as of the convenience of the public, of reducing their gauge to the national standard.

This important subject has already occupied so much of our space, that our remarks, founded upon the instructive evidence which has been brought before the public by the recent investigation, must be limited to two leading points, in both of which the public are deeply interested. The first of these is the increased probability of accidents. Happily the number of accidents which have already happened which can be regarded as even remotely bearing on the question of gauge, is too small to enable us to find any general conclusions upon them. Perhaps the most important that may be developed is that in the cases where due care is exercised, is almost as great as can be expected. The comparative narrowness of base, which, as far as we remember, is the only definite element of danger charged upon the broad-gauge lines, has never been proved injurious in any important degree. Probably no accident has ever occurred of which it can be regarded as the cause, and we are not aware of any in which it can be proved to have increased the damage. On the other hand, it might be difficult to say that any particular accident which has happened upon a broad-gauge line might not have occurred if the gauge had been narrower, the increased width may in many cases be seen to have an injurious effect. The greater weight of the engine and the larger amount of dead weight which, in practice, attends the use of broad-gauge carriages, increases the injury to the track, and from this increase of the distance between the wheels in going round a curve, which frequently leads to collisions, or of giving so fearful a character to many railway accidents. The greater length of the axles, although accompanied by increased braking power, is the most irresistible moment of the gauge, and the strain of which it is one of the small ones would do. Adding to this the circumstance that a curve of given radius is less easily rounded by a broad than by a narrow-gauge carriage, and that the rails are more likely to be deformed at the points of stress, it is evident that even narrow gauges would be amenable to the conclusion that the risks of breaking down or running off the line by the failure of axles are considerably augmented by an increase of gauge. Another circumstance which materially affects this question is the effect of increased width upon the oscillatory or lateral action of the carriages.

A short carriage is obviously more liable to this motion (which, at high speed, becomes dangerous from the danger striking the rails on each side alternately, until at last the motion literally throws the carriage off the rails for a long one; and therefore a carriage suitable for the 7-feet gauge will, unless it be half as long again as would be used upon the 4 feet 8½ inches gauge, be less safe in this respect. Even upon some of the earliest broad-gauge companies this proportion has led to the use of six-wheeled carriages, and such are exclusively used in the fast trains upon the Great Western line; but in order to attain an equal degree of safety in this respect, the broad two systems requires carriages far larger and heavier, as to be difficult to move at stations, where they must often be shifted by hand power, besides involving the conveyance of an enormous amount of dead weight when, as is often necessary in working branch lines, a carriage must be sent through for the accommodation of only two or three passengers. The ordinary second-class carriages of the Great Western line, mounted upon six wheels, are calculated to carry twenty passengers, and are therefore only suitable for a very large and steady traffic; yet in these the length is no greater in proportion to the breadth than in the ordinary second-class carriages for three passengers only on the broad gauge. In goods wagons the same argument holds good with even greater force; while in the case of carriage-trucks and horse-boxes the length of the vehicle is absolutely regulated by the maximum of 7 feet 6 inches, while the distance between the axles is 7 feet. Such a carriage, running as it were broadside foremost, must, at very high velocities, be productive of fearful danger to the train of which it forms a part. The same reasoning will of course apply to the passenger as well as the carriages.

The second point to which we should direct attention is the bearing of the gauge question upon the future prospects of the railway system, not as regards the importance of uniformity, or the comparative cost of construction and working, but as regards the probable advantage of the broad-gauge system. "The traffic of the West of England," observes Mr. Sidney, "requires 'not huge unwieldy carriages and trucks, but handy wagons, which may without inordinate trouble or expense be run into small road stations and sidings, to which a farmer may send his couple of fat oxen, or his score of sheep, or his load of corn, in conjunction with one or two more neighbours.' Of such local traffic, however, there has been little upon the Great Western railway, although it runs through large coal and cattle-breeding counties, because 'the whole machinery is on too vast, costly, and magnificent a scale'; and he conceives the traffic of sad that were it not for the general diffusion of more powerful engines, a gauge of 4 feet 8¾ inches would be preferable for such districts. Mr. Robert Stephenson, in his evidence before the commissioners, referred to a line of about 60 miles laid upon the broad gauge, &c., "the traffic of which has been not more than between 100 and 150 passengers per day. But of the 4 feet 6 inches gauge, he believed, 3 feet 9 inches, which was worked satisfactorily by locomotive engines, both for passengers and goods, and was constructed very economically, as a proof that a gauge of more than 4 feet 8¾ inches was not so advantageous with advantage. In South Wales, where the broad gauge is about to be introduced through the influence of the Great Western..."
company, its unfitness appears even more striking. The mines and iron-works in that district are usually situated in narrow valleys or gullies, in which sharp curves are unavoidable; and, to suit the peculiarities of the country, the local traffic is carried on by narrow-gauge lines, and some of them as narrow as 2 feet 6 inches.

Allusion was made in the course of the gauge evidence to the practice of sending passengers through from end to end of their journey without change of carriage, although they might have to pass over the lines of different companies. Those witnesses who endeavoured to mitigate the evils of gauge passing by the practice of running through lines mutually, for the practice of running through lines must of necessity be in a great measure discontinued. The evidence of Messrs. Brunel and Saunders, the engineer and secretary of the Great Western railway company, was so calculated to convey an erroneous impression as to the practice of the other great companies in this matter, as to call forth an explanatory pamphlet on 'The Origin and Results of the Clearing System,' which is in operation on the Narrow-Gauge Railways, with Tables of the Through-Traffic in the year 1845,' in which it is observed that "No sooner had the railways which extend from London to Liverpool been completed and connected in 1838, than it became evident that arrangements must be adopted to facilitate the passage of the traffic," at the points where the three railways (then under different managements) joined, so that passengers might be permitted to perform any journey with the least inconvenience, which continue by one or more way extended, without being required to change their carriage; and that a similar principle must pervade the arrangements for working every description of through-train if the public accommodation and facilities, and the interests of the railway system developed to their full extent. The importance and at the same time the difficulty of carrying out these principles became more obvious when the lines extending from Rugby and Leamington to York were completed. For some time, however, dissensions arose between the different companies; it was difficult to obtain accurate returns, and payment for the use made by the several companies of one another's carriages and wagons respectively, and some of them came to the end to make an unacknowledged use of the carriages and wagons of others to an extent which amounted to a positive grievance.

Under these circumstances it occurred both to Mr. Robert Stephenson and to Mr. K. Morrison, the present manager of the Railway Clearing-house, that a remedy might be found in the establishment of a central office on the principle of the Clearing-house by which the business of the London bankers is so materially facilitated. [BANK, P.C., p. 385.] After some difficulties the proposed system was, on the 2nd of January, 1849, brought into operation on the railways extending from London to Darlington, Newcastle, Edinburgh, and Edinburgh, and returning by Berwick, Newcastle, Scarborough, Hull, Yarmouth, and Cambridge, to the metropolis; or, in other words, on all the narrow-gauge railways in Great Britain lying north of the Thames, with the exception of the few short ones which are beyond the limits of this account; an area which, it is hardly necessary to observe, is only prevented from extending to the southern parts of England by the intervention of a differential gauge. The fundamental principles of the Clearing-house system, the regulations founded upon which are very rarely departed from, are, that passengers shall be booked through at all principal stations, and conveyed to their destination without change of carriage; that horses and cattle be in like way carried through without change of conveyance, and goods without being shifted or re-arranged; that the companies shall pay a fixed rate for such carriages and wagons, not their own property, as they may need, and a further sum per day by way of fine or demurrage for detention, if kept beyond a prescribed length of time; and that such agreements are to be made in such a manner that the passengers shall pass through the Clearing-house.

Junctions, Station Conveniences, and Signals. Many ingenious contrivances of the switch kind are in use, which may appear to render accidents almost impossible, so far as the action of the movable rails is concerned; but one of the most important precautions attending their use is that now generally adhered to, of 'making all sidings and crossings join the main line in such a way that trains must proceed backwards in order to enter or leave the siding or crossing,' as inserted in the article RAILWAY, P.C., and reversing the position of the arrows in the crossing marked e. The reasons for this precaution will be readily understood. As the diagram now stands, the tracks of the crossing are parallel, and is therefore liable, if they should be accidentally misplaced, to be turned into the wrong track, with imminent danger; but, if, by reversing the position of the arrows, the upper track in the diagram is appropriated to traffic running from e to f, and the lower to traffic running from f to e, it will be seen that (assuming the switches to be, as they usually are in such situations, of a self-acting kind, on the principle of that represented at Fig. 10, upon the same page) instead of the trains being turned into the wrong line, the flanges of the train would open the switch, and it would continue its journey without danger. In order to enter a siding or passing so laid, the train must run past the switches, must then be brought to a stand, and be propelled backwards, by reversing the motion of the engine, when the switches are properly adjusted; but the trifling inconvenience and delay occasioned by this manoeuvre is amply compensated by the greater security afforded by the arrangement to the transit of the ordinary trains, and all such as may have to pass the junction at a moment's notice or consideration of only the speed of any three or alarming accidents, illustrative of the danger of laying sidings into the main line so as to meet the traffic, upon the Brighton, Lewes, and Hastings railway, where, as there was at first a siding extending from the coast, for the purpose of such an arrangement was of course inevitable; while the increasing use of fast or express trains renders it highly important to adopt every precaution which may lessen the risk of running full speed through stations where the use of switches and sidings is necessary. Accidents have occurred through the rolling of carriages from a siding on to the main line by the action of wind, or from some other cause, and thereby exposing passing trains to danger; to guard against which "self-acting clocks have been introduced in some situations. These consist of pieces of bent rail or other iron bar so mounted that, while they may be turned aside out of the way by the wheels of a train, and thus allow a carriage to pass, when the wheel rises up as soon as the carriage has passed, and prevent it from rolling back towards the main line, excepting while they are held back or cleared of the rail by an attendant, by means of a lever handle similar to those used for working switches. Another contrivance, which is sometimes adopted with similar intention to the above, affords the power of laying such tracks as are often required for the purpose of conveying the carriages and wagons from one line to another, without in any way interfering with the rails of the main line. It consists in laying the rails which constitute the cross track for the full length of the main line, and, when the carriage is not required, cutting them off, of course, a little short of the points of intersection. By this arrangement the flanges of a carriage being pushed along the cross track, mounted upon and roll over the rails of the main line, and in running on the cross track the carriage until the wheels again reach the elevated rails of the main line, into the details of the method by which these objects are attained, or the advantages which either have been or are expected to be derived from the establishment of this system, the ultimate result of which will be to go a considerable part of the way towards Great Britain, as far as regards the working of the through-traffic, the character of one concern, conducted on a uniform system, we may state that the tables appended to the present paper show that in the year 1846 these passenger trains were conveyed an average distance of 146 miles each, while the average length of the railways upon which the system is in operation being only 41 miles, each travelled on an average of about 360 miles, by using the junctions or points of convergence; and that to accommodate these passengers, 59,765 railway carriages and 6813 trucks with private carriages were sent through. The tables further show that, in addition to the very large number of wagons used for the conveyance of coke, coal, and other minerals, of which no record is kept at the Clearing-house, 180,806 wagons loaded with merchandise were sent through in a similar manner."
track.

The necessity for breaking the continuity of the main rails by the switching points is thus avoided, and the smoothness of the transit upon the main line is undisturbed.

Some important improvements in turn-tables, tending to diminish the friction and noise occasioned by passing over them, deserve a passing notice. Some are laid with elevated cross tracks of the kind just described, so as to leave the rails of one track smooth and uninfluenced by any number and weight of the vehicles passing over them, or by the shifting of the turn-table being accidentally left in a wrong position. In this contrivance the central portion of the tracks, both of the main and cross lines, is fixed or stationary, the only portion that actually turns being an annular platform, the surface of which is so adjusted to the level of the rails, that a carriage coming upon it when turned into a wrong position would roll over it upon its flanges, coming upon the fixed track in the centre soon enough to avoid any risk of being turned out of its proper course, and, crossing the second half of the annulus again upon its flanges, would reach the fixed track beyond it without being thrown off the track. Some ingenious features of this turn-table, designed to ensure readiness during the passage of a train, are the subject of dispute between Mr. Dunn and Mr. Ellis, the patentee of another improved turn-table.

In the use of efficient signals great progress has been made within the last two years. But when we consider the varying degrees of difficulty of the various turn-tables and the different positions of this character we shall only advert to the admirable system of signals on the semaphore principle, introduced by Mr. C. H. Gregory upon the London and Croydon railway, and which, with various improvements suggested by experience, has been adopted on the lines of the South-Eastern, Brighton, and some other railway companies. The ordinary apparatus mounted at every station, and at each approach to stations of the more important places, is designed to give notice of the two movable arms mounted upon a common pivot near its upper extremity, either of which is capable of being moved independently of the other by means of a handle near the bottom of the post; so as either to hang vertically, in which position it falls into a slant in the post so as to be invisible; to project from it in a horizontal direction, or at an angle of 90°; or to assume a position intermediate between the vertical and the horizontal, projecting downwards at an angle of 45°. Each arm, whatever be its position, refers to its own particular track; that projecting towards the right referring to the right-hand track, and that projecting towards the left to the left-hand track; and when dropped within the post the arm indicates that the line to which it refers is clear, so that trains may pass on safely; when projected horizontally, that a train is a short distance behind the obstruction on the line, or that, for some other reason, any approaching train can cross or overtake, or when projected at an angle of 45°, that, owing to a train being ahead, though at a safe distance, or owing to some other circumstance, the line is closed, and no other train can cross or proceed cautiously until again reaching a signal of safety, or 'all right.' As these semaphore signals can only be seen in the day-time, signal lamps, with powerful parabolic reflectors, and capable, by the turning of handles at the bottoms of the posts, of being shifted so as to throw their light through either a white or colourless, a red, or a green glass, according to whether the signal required be to indicate safety, danger, or the necessity of caution, are mounted near the tops of each post; one lamp directing its light up, and the other down the railway, and each being visible only in its own proper direction, for the guidance of approaching trains. At the junctions of lines on the same ground, but two turn-posts are employed, one for each line, each having two arms, one for the down and the other for the up track of its particular line. The arms and lamps in this case have but two positions, one or the other, and no intermediate position; and the working of the switches and the signals for both lines is effected simultaneously by the hands and feet of one attendant. The engine-driver of every train, on approaching the junction, inclines the lamp to the direction most convenient for him to see in the light in which he wishes to proceed. In addition to these fixed signals, the mechanical details of which are fully illustrated in the 'Railway Chronicle' for 1844, pp. 423 and 415 (from which we have taken the order of these apparatus, for night and day signals, costs about 30l.), hand signals are made by the attendants and workmen upon the line either with the arms alone, with white, red, and green flags, or with red and white lamp, and at such time as a signal is not day-time when are to be passed through, white lamps attached to the front of the engine, and red lamp behind the last carriage of the train, are used as signals with every train, while a green light at the head of the train will indicate trains destined for one line from those of another, wherever, as in the case of the Croydon, Brighton, and South-Eastern lines, the junction of different railways renders such distinction necessary. The red lamp, or a green light, if the train be hung, at the tail of the last carriage of a train, serves to indicate that it is to be followed by a special or express train; and a similar signal attached to the front of the engine of an express train acts as a special warning to keep the line clear on its approach.

In cases where the foggy state of the atmosphere might prevent the signals from being seen, and in other cases of emergency at night, the fog signals invented by Mr. E. A. Cowper are very useful. These are flat circular boxes of about two inches in diameter, filled with an explosive mixture, and furnished with a narrow slip of sheet lead, by which they may be readily fixed upon the top of the rail, in such a position that, when run over by the wheel of the engine, they will produce a loud detonation which warns him to stop. Such signals, with printed directions for their use, are deposited in every station and on the lines by the railway companies; and in case of an accident happening at night, several are fixed at intervals beyond the point of obstruction, so as to give repeated warnings to an approaching train. When the line is clear they may be taken up again and kept for future use. Such signals are used to stop all trains approaching a junction during a fog, until, by the sounding of the engine whistle and of a bell mounted for the purpose at the junction, the nature and duration of the obstruction of the track, and indicates that the line is clear for it.

Carriages. Some remarks having been made on the advantages of increased length in carriages in treating on the gauge question (see p. 667), we need only observe on that point that six-wheeled carriages are now used with advantage upon many narrow-gauge lines, and that still longer vehicles, having eight wheels, and some provision for adapting their sales to a curved track, have been tried, though on a limited scale. In the 'Railway Times' of 1843, pp. 992, 993, are some extracts from a report emanating from the carriage factory of the Leipzig and Dresden railway company, showing carriages of extraordinary dimensions adapted for the German railways, illustrated by an engraving of an eight-wheeled carriage, 47 feet long, and containing seats for 112 passengers. From this paper it appears that bowstrings, which, owing partly to the nature of the German railway line, did not need railway carriages, had not been brought into use so extensively in this country as was anticipated, were greatly preferred in Germany, as indispensible for their effects. In the case of the German.Spring-Carriage, P. C., pp. 387, 388. The inconveniences attending the use of very capacious vehicles for a fluctuating traffic may be met in some measure by extending the plan, which is gaining ground in this country even with carriages of the ordinary dimensions, of combining accommodation for different classes of passengers in different compartments of the same vehicle; a plan which is especially desirable where many branch and connecting lines have to be provided for, to enable the railway companies to send passengers through without a change of carriage, and without involving the conveyance of more dead weight than is absolutely necessary. As a general remark we may say that while the most modern English railway carriages are more elegant in appearance than those of older build, they are both more roomy and stronger in the frame-work, which, in some of the most recently constructed, is made thoroughly as good as can be; experiments or even shown that light carriages would not bear the strains to which they are exposed.

Locomotive Engines. Among the results consequent upon the use of culminating, ground, and the great increase of railway traffic, and the growing demand for increased speed, is a general enlargement of the locomotive engine, usually combined with some deviations from the conventional form; most of these improvements were pointed out in our articles on pp. 559, 560, written. Coupled wheels, which were formerly used mostly exclusively for goods trains, are now
larger and increasingly employed forenger traffic, it become folly to work them at very high velocities. To this change we are inclined to attach considerable importance as a matter of safety, since, independently of the injury done to the road by throwing an enormous weight upon a single point, the wheels, in order to maintain their adhesion, the tendency of the engine to a dangerous rocking motion at high speeds is undoubtedly often increased by that circumstance; for if a disproportionate share of the weight of the machine is imposed upon a single wheel, the two ends will have a degree of play upon their bearing springs which may allow the motion we refer to to increase until the engine is thrown off the rail, as there remains no support for the wheels. Another accident which no obvious cause could be discovered for the engine leaving the rails. There can be no doubt that, with an equal amount of adhesion, a firmer and steadier bearing upon the rails may be obtained when the principal weight is divided between two axles than when it is thrown upon one. The necessity for increased power. calling for the use of larger boilers and cylinders, is resulting to the very general abandonment of that construction of engines in which the cylinders are placed at the bottom of the smoke-box, and the machinery is under the boiler; and a growing preference for those in which the cylinders are fixed outside the frame, and the power is conveyed to the wheels by external cranks and connecting-rods. Engines in which the machinery is thus arranged may be greatly enlarged in all their parts without raising the centre of gravity, the depth required by the smoke-box under the boiler being saved; and they have the further advantages of far greater strength in the axle, and of the whole of the machinery being easy of access for the purpose of examination and repairs. Most important of all, the mechanism perhaps, may be examined and attended to while the engine is running; iron foot-plates, with hand-rails, being constructed along the sides of the frame of the engine. In some narrow gauge engines boilers are used of 3 feet 9 inches diameter, being the largest dimension that the gauge will allow, and the sectional form has in a few instances been made slightly elliptical, the longer axis of the ellipse being placed vertically. In the boiler; but more generally in steam engines the temperature as generated in the fire is maintained by a larger diameter since the economy of fuel is concerned, although, perhaps, looking to the difficulties occasioned by the expansion and contraction of the metal, they may have reached the utmost attainable length with the present construction of boiler. Mr. Stephenson does not state the precise length to which he has extended the boiler; but General Pauley observed that in his long engines it is four or five feet longer than in those formerly used. The distance between the hind and fore axles of the engine to which the accident happened (a six-wheeled one), is 10 feet 6 inches; and from that to 12 feet 9 inches (which, in his evidence before the Gauge Commissioners, Mr. Stephenson stated, was, in his opinion, the great length of bearing of most recently constructed engines for the narrow gauge; while 5 feet 6 inches was the length of bearing formerly employed on the London and Birmingham railway, with four-wheeled engines, though that length has been extended to about 7 feet. Notwithstanding the great length of bearing, the fire-boxes of the long-boiler engines referred to project beyond and overhang the hinder axle, so that the whole length of bearing is as much as twice the length of bearing upon the rails as in the original four-wheeled engines of the Birmingham line, with a bearing of only 5 feet 6 inches. Such large and powerful engines, by which it is anticipated that so much as 2000 tons may be safely attained, are necessarily much heavier than those of the older construction, though, perhaps, not so in proportion to their increased base. The Great Western Company, however, are constructing engines of considerably greater magnitude. The first of these, called the Great Western, accomplished an experimental trip from London to Bristol, in June, 1846, in 2 hours and 26 minutes, including two stoppages, being at the average rate of 58 miles per hour, with a train of ten cars, and 150 tons of passengers. It is a 3.21 mile, at the rate of 51 miles per hour. This engine has about 1750 square feet of heating surface in the boiler; has cylinders of 18 inches diameter and 34 inches stroke; driving-wheels of 4 feet 8 inches diameter. I believe has been the total length is 24 feet; the distance between the supporting wheels 16 feet; the weight of the engine alone, without fuel or water, 284 tons, and of the tender, 10 tons; and the total weight of engine and tender, when loaded, about 56 tons. Whether the railway will be able, without ruinous expense in repairs, to bear the rapid action of so enormous a weight, remains to be seen; but if unofficial reports may be trusted, both road and engine have proved already very costly to keep in order. It is worthy of remark, though we have no means of testing the absolute truth of the statement, that about the time when the above-mentioned feat of speed was accomplished it was proposed to be turning out from the establishment of Messrs. Sharp and Roberts, eminent engine-builders of Manchester, of a narrow-gauge engine called the Atalia, which, after being tested on the Birmingham line, was not found capable of maintaining a speed of 58 miles an hour with a train of ten cars, over undulating gradients, and which, with its tender, weighed only 25 tons. Allowing that this engine was largely used for trial, and in the case of pausing before the astonishing speed of the 'Great Western' engine is set down to the credit of the broad gauge. The revival, by Mr. Fairley, within the last few months, of the often attempted road of the London and Brighton railway, which has in locomotive power in locomotive engines, perhaps only deserves notice here to call attention to the fact that, supposing the mechanical difficulties to be overcome, which, from the action of Mr. Fairley, have already been increased, power, or the case, it remains a question whether the power required for the condensation of air into the reservoirs from which the proposed locomotives were to be supplied, might not be as well or better employed in propelling the trains in some other way; and to remark, that many of the assertions made respecting the superiority of the proposed air-locomotives to steam-engines in locomotive and tractive power, are too absurd for serious refutation. Atmospheric Railway System. To what has been already said on this subject under RAILWAY, P. C., p. 280, and Atmospheric Railway System, a paragraph, 'that there may be added. Of the proposed atmospheric line alongside of the London and Croydon railway, alluded to in the last-mentioned article, a portion of about 5 miles, between Croydon and the edge of the forest, the danger of fire, and the number of the running of experimental trains, and has been employed for working the regular traffic, in conjunction with locomotive engines from London to Forest Hill, for several months. This railway is constructed upon the eastern side of the locomotive line, and therefore, to avoid interference with the Brighton line at the point where it diverges from the Croydon, it is conducted over that railway by a timber viaduct, to which it rises on each side by a slope of 1 in 50. The first experiments were highly satisfactory, a speed of from 60 to 75 miles per hour, with considerable loads, having been attained, and the formidable slopes of 1 in 50 ascended without difficulty, especially in the summer, when too many is usually being brought to a stand at its foot. It was also found, by stopping the action of the stationary engine near the middle of the 5-mile length, and leaving the whole 5 miles to be worked by the atmospheric system, that a considerable saving in time was thereby made, as all the necessary construction of the air-pumps, or some other matter capable of easy remedy, than with the system of propulsion itself. In several instances a greater has, from some cause or other, been observed, especially at the inclined planes of 1 in 50 above referred to; and during the very hot summer of 1846 an unexpected difficulty arose from the iron tubes becoming so heated as to melt the composition by which the valve is sealed;
by the failure of which the vacuum was destroyed, and it
became necessary again to transfer the traffic to the locomotive
line until a harder composition of a new and, it is
anticipated, a better valve lived. In the mean time
the continuation of the atmospheric line from Forest Hill to
New Cross has been nearly completed, and arrangements
have been made for its opening; but however the Croydon and
Epsom line has been constructed, and is expected to be ready for traffic about Christmas, 1846, the
atmospheric system has not been laid upon it, and it is
intended to work it in the first instance with locomotive power;
the engineer-in-chief, Mr. William Cubitt, having recom-
manded that course on the ground that the atmospheric sys-
tem is the one that has been most exposed to test and
comparison, is 'too important a matter either to be hastily extended or
hastily thrown aside.' In the session of 1846 the act for the
projected Direct London and Portsmouth railway (which was
defferred from the session of 1845 for want of time to pass
through the House of Lords) was passed; but the arrange-
ments which have been entered into between its promoters and
the London and Brighton and London and South-Western
railway companies render it almost certain that it will be
constructed as a locomotive line. Under these circumstances,
which render the anticipated extension of the atmospheric
system for the present doubtful, it is unnecessary to enter
upon a consideration of the part of the issues suggested by a
comparison between it and the locomotive system; or to notice
the arguments which have been adduced in favour of atmos-
pheric traction on the ground of its superior safety, economy,
and power, in which the locomotive engines are unsuitable. To what has been
said under ATMOSPHERIC RAILWAY on the history of
schemes for atmospheric propulsion we may add that since
that article was written, many new contrivances have been
propounded, of which perhaps the most deserving of notice
is that of the late M. Hallette, in which the connection between
the cargages and the piston is effected by a thin flat bar or
rods, passing through a circular opening at the side of the
atmospheric tube, which slit is closed during the passage of the
coupler by the contact of two continuous air-bags, or air-tight and highly elastic hose or pipes of
caoutchouc covered with cotton and leather, which are
inserted, in a collapsed state, in grooves or cavities formed
on the top of the pipe to receive them, and are then inflated
with air so as to press against one another with considerable force.
The action of this, the most simple of all the proposed valves,
is illustrated by the passing of a paper-knife between the
closed lips; the valve itself consisting, as it were, of a pair of
continuous lips, capable of being pressed together with any
required force by inflating with compressed air. Many of the
other proposed plans are more remarkable for their compli-
cation than anything else. We may refer to the 'Mechanics'
Magazine' for January 24, 1846, for a list of one or
which will be found published in the Technical Journal;
many of these, although we need further information in order to judge of its practical value. The in-
vention to which we allude is the magnetico-atmospheric rail-
way of the Patent of railway engines which will be necessary for a valve is avoided by the employment of electro-
static force to connect the cargages with the piston in the tube.
From a letter in the following number of the magazine
it would appear that the patents are not alone in their claim
to this ingenious idea.

Railway Labourers and Railway Accidents. The condi-
tion of the labourers employed on railways, the state of wretched-
liness and demoralization in which they are often compelled
to live, and the loss of life, injuries of person, and deterior-
tion of health, to which they are subjected by the careless
management of contractors, have become matters of anxious investigation to all who are interested in the welfare of the
labouring classes. 'A Report of the Select Committee of the
House of Commons, appointed to inquire into the Condition
of the Labourers employed in the construction of Railways and
Canals, and the state in which they are employed,' was laid before
the House of Commons and printed with supplementary
Observations; being a Letter of John Robertson, Esq., Sur-
geon, President of the Society. 'Statements on Railway

Contracts and Railway Labourers, by Robert Rawlins,
Esq., Engineer of the Bridgewater Trust.' 'Observations as to
some of the Effects produced in this country by the
expenditure of Capital on Labour in the construction of Rail-
ways; together with Observations on the Principles of Legis-
lation and Jurisprudence applicable to the Public Protection,
by Prevention of Factories Acts, and for the better Regulation
of Labourers employed in dangerous works; by Edwin Chad-
wick, Esq., Barrister-at-Law,' &c.

It is abundantly proved by the evidence adduced in these
papers, that large bodies of workmen are hastily collected,
and crowded into hovels, without any provision being made for
comfort or decency; that they are not only hard worked, but
exposed to the necessary risk of life and limb; that they are cheated of a considerable part of their
hard-earned wages, by being compelled to deal at tally-shops
by means of tickets, while payments are only made once a
month or even two months, thus, by a system of work and
payment, to expose the men to the temptation of spending carelessly, and
of drunkenness, by receiving the balances due to them in an
accumulated sum; that no provision is made for instruction,
religious or merely educational, for the men or their children,
and that there is, in consequence of all this want of care and
want of principle on the part of the contractors, great wretched-
ness, discontent, disorder, drunkenness, and debauchery, on the
part of the labourers. The Directors of the Liverpool and
Bury Railways are stated to have voted 1000l. a year for the
special purpose of the care of the workmen, to obtain good
lodgings and rooms for living in, and other comforts and
conveniences.

As many millions of pounds must be spent, and many thou-
sands of men be employed in the construction of the railways
which have already received the sanction of Parliament, it is
desirable that the Legislature should interfere to protect the
labourers, by suitable legislative measures, from the neglect
and cruelty of those who employ them.

With respect to accidents which occasion loss of life or in-
jury of limb, either to workmen in the construction of railways,
or to passengers in transit, Mr. Chadwick was examined by the
Committee of the House of Commons before mentioned
as to the provisions of the French law in such cases. Mr.
Chadwick adduced the following provisions of the 'Code
Civil':—

'Art. 1383. Every act whatsoever of the man who occa-
sions a damage to another, obliges him by whose fault it hap-
pens to repair it.'

'Art. 1383. Every one is responsible for the damage he
has caused, not only by his act, but by his negligence or by his
imprudence.'

'Art. 1394. A man is responsible only not for the
damage occasioned by his own act, but also for that which is
occasioned by the act of persons for whom he should answer,
or of things which he keeps in his charge.'

These provisions of the French law, Mr. Chadwick states,
were understood to extend to companies, as well as to indi-
viduals; yet, by a law of July 15, 1843, on the general ma-
terial law of railways, which made the directors responsible for
the greater safety of railway passengers. The 22d clause
makes all owners or lessees of railroads responsible to individuals and
the state, for injury caused by managers, directors, or
any people employed in any capacity whatever in the working
of them. Other clauses, from 16 to 21, enact penalties
against those through whom accidents may be brought about,
and for the mere violation of the regulations established by
the king or prefects for the management of railways, even
when no accident resulted therefrom.

British Railways.

In the following tabular view of railway acts passed since
1840, supplementary to that given in P. C., p. 261, a large propor-
tion of those described as for new lines are merely for
constructing branches from or extensions of lines previously
authorized; while the remainder may be calculated to lessen the peculiar evils, if any, of that condi-
tion,' has been published (1846). The Statistical Society
of Manchester have also published (1846) the following Papers,
which must be taken only as a part of the papers which
have been published. 'Statistical View of the Accidents,
Fatal Accidents, Wounds, and Injuries, sustained by Work-
men engaged in the construction of the Summit Level Tunnel
of the Sheffield and Manchester Railway; and a Description
of the ground, with the results of the observations of
Observations; being a Letter of John Robertson, Esq., Sur-
geon, President of the Society. 'Statements on Railway
### Railway of England and Wales.

**Aberdare.**—From the Talyllyn Railway, near Ynys Mynegick, to Aberdare; length, with a branch, 84 m.; act passed 1843; opened August, 1846.

**Aberdare and Beaconsfield, and Boston and Eastern Junction.**—From the Ambergate station of the Midland Railway, through Nottingham, to Spalding and Boston, with branches. Main line to Spalding, exclusive of portions of lines to Lincoln and Licoln lines which are to be used, 594 m.; Boston extension 194 m.; Seafor branch 9 m.; canal branch 1 m.; Boston branch 2 m. Act passed 1843; sold to the Great Northern Railway Company. The act confers powers to purchase the Nottingham and Grantham canals.

**Ashby, Newton, and South Devon.**—A branch from the South Devon Railway, near Newton Abbott; length 104 m.; act passed 1846. The South Devon Company has an interest in this line.

**Ashfield and Hasland.**—See Brighton, Lewes, and Hastings; Rye and Ashford Extension.

**Ashford Branches.**—See Manchester and Birmingham, and Sheffield, Ashton-under-Lyne, and Manchester.

**Ashton, Stalybridge, and Liverpool Junction.**—Sold to the Manchester and Leeds Railway Company, from whose line it branchet off. Length of line from junction to Manchester 116 m.; and to Stalybridge in September, 1846. An act of 1845 authorizes a branch of 1 m. to join the Manchester and Birmingham line in Ashfield and Hasland. Act passed 1846.

**Aston and Gloucestershire.** [P. C., p. 262.]

**Aylesbury [P. C., p. 262.**]—Sold to the London and Birmingham, now London and North-Western Railway Company, whose line it joins at Bletchley. Length 16 m.; act passed 1845; opened November, 1846.

**Berks and Hants.*—A broad gauge line from the Great Western Railway at Reading to Newbury and Hungerford, 254 m., with a branch of 134 m. to join the London and South-Western Railway at Basingstoke. Total length 39 m.; act passed 1845; sold to the Great Western Railway Company.

**Birkenhead, Lancashire, and Cheshire Junction.**—From the Chester and Birkenhead Railway at Birkenhead to the London and Birmingham Railway at Stockport, 384 m., with branches amounting to 79 m.; total length 46 m.; act passed 1846. The company has agreed to amalgamate with the Chester and Birkenhead railways.

**Birmingham, Bristol, and Thames Junction.**—See West London, Birmingham, and Derby Junction [P. C., p. 262.]

**Birmingham and Midland Railway.**—Branch of the London and Birmingham Railway at Stockport, 384 m., with branches amounting to 79 m.; total length 46 m.; act passed 1846. The company has agreed to amalgamate with the Chester and Birkenhead railways.

**Birmingham, Bristol and Gloucester.** [P. C., p. 262.**]—Main line, from the London and Birmingham Railway, at Birmingham, to Gloucester, 33 m.; from the Westbury 2 m.; from the Gloucester Canal at Gloucester 1 m.; completed 1841. Amalgamated with the Bristol and Gloucester Railway, and the united lines leased in competition with the Midland Railway Company. The company has also authorised extensions at both ends of the line, and a branch at Stoke Prior, amounting together to 11 m.; and in 1846 the
Midland Company acted for a branch from King's Norton to Hales Owen, length 5½ m.; and to Some, Middlewich, and Manchester.—From the Grand Junction Railway at Aston, near Birmingham, to the Trent Valley Railway at Lichfield; length 14½ m.; act passed 1846.

Birmingham and Oxford Junction.—Main line from Birmingham to the Oxford and Rugby and Oxford, Worcester, and Wolverhampton (broad gauge) line at Wolverhampton, 11½ m.; branch to Dudley, 2½ m.; total length 14½ m.; act passed 1846. This undertaking was projected to connect the London and Birmingham Railway with the Wolverhampton and Dudley line. As this was never carried out, however, both this line and the Birmingham, Wolverhampton, and Dudley, with which it is intended to amalgamate, must be laid upon the Birmingham and Oxford Junction line.

Birmingham and North Midland.—From the Oxford and Rugby and Oxford, Worcester, and Wolverhampton (broad gauge) line at Wolverhampton, 11½ m.; branch to Dudley, 2½ m.; total length 14½ m.; act passed 1846. This line was never built, and the powers to adopt the broad gauge were not exercised. See page 672 for more details.

Bridgwater Navigation and Railway.—A short line of 2 m. to connect the Bridgwater and Bridgewater with the Bristol and Exeter Railway; act passed 1845.

Bristol and Torrington Canal, Railway, and Harbour.—The act for this line, a branch 10½ m. in length from near Stolford to Torrington, was passed in 1845, to connect the Bristol and Exeter Canal Company with the Bristol Channel at or near Stolford, about 9 m., with three tunnels and two bridges. The line was completed in 1850 but was never worked, as it was never completed to a harbour at Stolford. This and the Chard Canal Railway are intended to form portions of a projected line to connect the Bristol and Exeter Railway with the Western Counties Railway.

Bridgwater Branches.—See Hull and Salisbury, and York and North Midland.

Bristol and Chichester.—An extension of the Sambrean Branch of the London and Brighton Railway, by Worthing, and between Littlehampton and Arundel, to Chichester.

Brighton and Hove.—A new line of 3½ m. to Hove, with a branch to Brighton Marina, 2½ m.; act passed 1845, and opened in 1846.

Brighton, Lewes, and Hastings.—The original act, passed in 1844, was for a line from the Ouse to Hastings; an extension, 6½ m., from the Ouse to the River Uck, was granted in 1845. Shortly after, a branch of 9½ m. from Lewes to the London and Brighton Railway at Keymer, to shorten the distance to London, was added, and under that for the line next following in this table the original line was diverted from the Hastings end. The main line was opened in June, 1846, from Brighton to Bulverhythe, 5½ m.; from Brighton and about 2½ m. from Hastings, whence an extension to the permanent station at St. Leonards began and was opened in November, 1846. An act of 1846 sanctioned some deviations from the Kemyer branch, and branches to Eastbourne, nearly 4½ m.; to Hallisham, nearly 3 m.; and to Seaford and Newhaven (the new branch of the London and Brighton Company not having been made) 8½ m.; total, 16½ m. Sold in 1848 to the London and Brighton, now the London, Brighton, and South Coast Railway Company, by whom the above branches are to be made.

Brighton, Ewell, and Esher.—A line of 11½ m. to Ewell, and an extension of the Epsom and Ashtford branch; act passed 1845, and opened in 1846.

Bristol and Exeter.—Formed by the amalgamation of the Bristol and Gloucester and Birmingham and Gloucester lines, which, immediately after agreement, is to be known as the Great Western Railway Company. Their consolidation with one another and with the Midland is sanctioned by an act of 1846.

Bristol and Gloucester.—An act of 1845 sanctioned a new branch of 4½ m. at Bristol, one of 2½ m. to Clevedon, one of 20½ m. to Yeovil, and one of 4½ m. to Taunton. Total length 31½ m.; act passed in June, 1846; and a third act was obtained in 1846, for a branch of about 15½ m. to the North Union line at Bamber Bridge, to thence to Preston, for 9½ m.; act passed in 1846. A branch from Blackpool, making altogether about 2½ m. Another act of the same session confirms the amalgamation of the whole undertaking with the East Lancashire Railway.

Buckingham and Breckley.—See Buckinghamshire.

Buckinghamshire.—This undertaking consists of two distinct lines, sanctioned by separate acts of 1845: one from the Oxford and Bletchley Junction, from Oxford to the London and Birmingham Railway at Bletchley, length 29½ m.; and the other, from the Midland Railway to the first-mentioned line to Buckingham and Breckley, about 10½ m.; total length, 40 m. The acts confer power to sell or lease the lines to the London and Birmingham, now London and North Western Railway Company.

Bulloch.—See Forest of Dean.
Dundee and London and Birmingham. — From the London and Birmingham line near Leighton Buzzard; length 2 m.; act passed 1845. To be leased or sold to the London and North Western Railway Company.

Dorset Central, New Forest, and Roan, 263. — Length, from the Seasham Railway to the Stanhope and Tyne Railway (both of which were made without acts of parliament), nearly 5 m. Purchased by the Newcastle and Darlington Junction Railway Company.

Durham and Sunderland [P. C., p. 263].—Purchased by the Newcastle and Darlington Junction Railway Company, and to be adapted to the steam-engine system.

East and West India Docks and Birmingham Junction. — From the East and West India Docks to the London and Birmingham line near Newhall; length 2 m.; act passed 1846. Promoted by the London and Birmingham Railway Company.

East and West Yorkshire Junction. — From Knarborough to the Great North of England Railway about 14 m. from York; length, barely 15 m.; act passed 1846.

East Anglia. — Under this title it is proposed to amalgamate the Lynn and Ely, Lynn and Dereham, and Ely and Huntingdon lines, and to lease them to the Eastern Counties Railway Company.

East Lancashire (originally Manchester, Bury, and Ramsden). — From the Manchester, Salford, and Eccles Railway about 4 m. from Manchester, by Bury, to Rawtenstall; length 14 m.; original act passed 1844; amendment act, in which the Company was altered, 1845; act passed September, 1845. The branches have been amalgamated with the Blackburn, Burnley, Accrington, and Colne, the Blackburn and Preston, and the Liverpool, Manchester, and Southport, and the branches of the railway have been abandoned. The track between the line and the Manchester, Salford, and Eccles Railway have been added to the stock of the Company. Act passed 1846. Length 27 m.; act passed 1846; and deviations to the extent of 83 m. on the extension line.

East Kent Railway. — From Great Chart to Tenterden and Aford, to Bordon; length 48 m.; act passed 1846. Sold to the Great Northern Railway Company.

East Riding of Yorkshire. — From Driffield and Yarmouth, 253. — Opened from London to Colchester, 151 3/4 m., in March, 1843, and the remainder of the original parliamentary line abandoned; the Eastern Union; Ipswich, Bury, and Newmarket, 301 3/4 m.; act passed 1845. The extension of about 30 miles from Newmarket to Ipswich is taking up place. In 1843 the Eastern Counties Company made terms of amalgamation with the Northern and Eastern Company, and became possessed of the possession of the line of about 30 miles from Newmarket to Ipswich, and of the branch of Great Yarmouth. In 1844 the Eastern Counties Company obtained an act for extending this northern line by Cambridge to Ely, and thence eastward to Brandon, and westward to Peterborough, making altogether 72 m. of new line, of which the portion from Bishop's Stortford to Cambridge, Ely, and Brandon, was completed in July, 1845. The course of the Ely and Peterborough line was altered for a length of 298 m. under an act of 1845, in order to pass through Marcham and Newmarket, November (1845) nearly completed. Another act of the same session authorised a line of 1 1/3 m. from Cambridge to Huntingdon. In 1846 the Eastern Counties Company abandoned the connection of their line with the London and Stratford stations; making a line from 11ford to Epping, 10 1/3 m.; and two branches, amounting together to little more than 10 m., which were abandoned. The line remains, which, as well as the North Woolwich, they have purchased. See also East Anglian; Enfield and Edmonton; London and Blackwall Extension Line; Stratford, Upnor, Woolwich, West Ham, Newmarket and Chesterton; and Wissich, St. Ives, and Cambridge Junction. The gauge of the Colchester and Northern and Eastern lines was altered in 1844.

Eastern Counties and Thames Junction. — From Stratford to the mouth of the river Lea; length 24 m.; act passed 1844; opened April, 1846. Sold to the Eastern Counties, which see. See also North Woolwich.

Eastern Union. — From Colchester to Ipswich; length 17 m.; act passed 1844; opened June, 1846. From Colchester the line was made by the Eastern Counties Company, the land being theirs; but this portion has been sold to the Eastern Union Company. The eastern end of the Colchester, Stour Valley, Southwold, and Huntingdon Eastern Union and Hadleigh Junction line, and Ipswich and Bury St. Edmunds.

Eastern Union and Hadleigh Junction. — Length, with two junctions with the Eastern Union line, 64 m.; act passed 1845. Sold to the Eastern Union Railway Company.

Ely and Huntingdon. — Length, under original act of 1845, 22 m.; but subsequently shortened by an arrangement for using the Eastern Counties line about 1 m. from Ely. See Ely Anglian.

Enfield and Edmonton. — From the Northern and Eastern Railway at Edmonton; length, 3 m.; act passed 1846. Power given to sell the line to the Eastern Counties Company.

Epping. — See London and Blackwall Extension; and Eastern Counties.

Essex Valley. — From the Midland Railway at Sawley to the Mansfield, Heanor, and Matlock Railway; length, 18 1/4 m.; act passed 1845; sold to the Midland Railway Company. For extension and branches see Midland.

Essex and Hertford. — Length of 18 1/4 m.; act passed 1845. Laid
to the Bristol and Exeter. To open December, 1846. An act for a similar line was passed in 1843, but was not carried into effect.

Fernier and Exmouth.—Length, with a very short branch at Topsham, 10 m.; act passed 1846.

Fleetwood, Preston, and West Riding Junction.—From Preston to Clitheroe: length, nearly 16 m.; act passed 1846. See Preston and Clitheroe.

Forest of Dean (formerly Bollero Hill).—[P. C., p. 263.]

Ferrers.—Original line, under an act of 1844, intended to connect near Dalton, Lindsey, and Slate-Quarries at Kirtlington, with the coast at Barrow and Ramsgate; length, 104 m. Opened in June, 1846, and passenger-traffic worked in connection with steamers from Fiel harbour to Fleetwood. An act of 1846 authorized extension of 34 m. from Sandal to Burton, one of 4 m. from Dalton to Ulverstone, and branches to the Whittriggs and Butts iron-mines, making a total of 9 m.

Gloucester and Cheltenham.—[P. C., p. 263.]

Gloucester and Dean Forest.—From Gloucester to the Monmouth and Hereford Railway, and to the South Wales Railway at Monmouth. Act passed 1846. To be laid on the broad gauge, and leased or sold to the Great Western Railway Company.

Great Eastern Railway (London and) E. Bay.—[P. C., p. 223.].—Opened February, 1842. See Great Eastern Railway.

Great Northern Railway.—[P. C., p. 263.], excepting the branch to the Great Northern Union station (linking the Great Northern Railway and the West Riding Railway Company), which was opened in 1845. The line extends from the Great Northern Union station to the Grand Junction Railway at London, and to the Hull, Beverley, and York Railway at York. The branch to the Great Northern Union station was opened in 1846. See Great Northern Railway.

Great Western (P. C., p. 263.)—Complete June, 1841. The company have purchased the Berks and Hunts, the Cheltenham and Great Western Railway, the Cheltenham and Exeter, and the Oxford and Rugby lines; lease the Bristol and Exeter: and posses the Oxford Branch, which see. See also, for further connections, the Birmingham and Oxford, and the Birmingham, Wolverhampton, and Dudley; Bristol and South Wiltshire, and Dean Forest; Great Western and Uxbridge; Great Western and Wymond; Oxford, Worcester, and Wolverhampton; Burnley; West Yorks; and Wilt, Someret, and Weymouth.

Great Western and Uxbridge.—Juts the Great Western line at West Drayton; length rather over 24 m.; act passed 1846. To be sold to the Great Western Railway Company.

Great Western and Wymond.—From the Great Western line at Maidenhead to Wymond. Act passed 1846. To be sold to the Great Western Railway Company.

Greenwich and Gravesend.—See South-Eastern Company.

Guildford Extension, Portsmouth, and Fareham.—Projected as the Guildford, Chichester, Portsmouth, and Fareham Railway; but the greater part of the line was authorized by the Direct London and Portsmouth, the act, passed in 1846, sanctioned only a line of about 4 m. from Guildford to the Direct London and Portsmouth at Farnham. The branch at Sandown, near Weymouth, is to be built with Portsmouth. The power to make these has been sold to the London and South-Western Railway Company.

Guildford Junction and London and South-Western Railway: length 6 m.; act passed 1844; opened May, 1845. Sold to the London and South-Western Railway Company. See Guildford East Junction and Nonsucham, and Guildford Junction line (which see), to the Newcastle and Dartington Junction, now York and Newcastle Railway Company.

Hay.—[P. C., p. 263.]

Hove.—[P. C., p. 263.]

Hoy.—[P. C., p. 263.].—Adapted to passenger traffic in 1843. See West Cornwall.

Hucknall and Westbridge.—[P. C., p. 263.]

Hunsford and Wandle.—[P. C., p. 263.]

Hull and Selby.—[P. C., p. 263.].—An act of 1845 sanctioned a branch of 31 m. from Hull to Bridlington, the greater part of which was opened in October, 1846, another point of which authorizes the leasing or sale of the whole undertaking to the York and North Midland and Manchester and Leeds Railway Companies. See Ipswich and bury, and Norwich. See Ipswich and bury, and Norwich. See Ipswich and bury, and Norwich.

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Launceston and Victoria [P. C., p. 263].—Abandoned.

Leeds and Bradford. — Original line, under an act of 1844, from Leeds, along the valley of the Aire, and by Shipley, to Bradford, 155 m., with a branch of 14 m. to the North Midland Railway, opened in July, 1846. An act of 1845 authorises an extension from Shipley to Colne, with a branch to Halton, together 30 m.; and acts of 1846 provide for an alteration of the route of 1 m., and a line to the West Riding Union Railway, at Bradford. After agreeing to amalgamate with the Manchester and Leeds, an arrangement was made in 1846, to supersede it by a perpetual lease of the whole undertaking to the Midland Railway Company.

Leeds, Dewsbury, and Manchester Junction. — From the Leeds and Bradford line, near Leeds, to the Dewsbury and Leeds Railway at Kirkstall, and thence to Huddersfield, being a main line of 31 m., with branches amounting to 4 m. The line from Kirkstall to Huddersfield, however, is only to be made if the Huddersfield and Manchester Company fail to complete theirs. Act passed 1845. A second act of 1846 provides for deviations at Dewsbury, and an extension of the main line at Huddersfield, to form a branch of 6 m. to the Birrastle branch, nearly 3 m. To be leased to the London and North-Western Railway Company.

Leeds and Selly [P. C., p. 263].—Purchased by the York and North Midland.

Leeds and Thirsk. — Main line 234 m.; branches to Knaresborough Railway at Wath; a branch of 4 m. to the Great North of England Railways, amounting together to 63 m. These are under the original act of 1845; others, passed in 1846, provide for the extension of the line to the Great Northern Railway from Thirsk to the River Nidd; for a line (the only part sanctioned of a proposed line from the Leeds and Thirsk Railway at Wath to Harrogate) from the Great Northern Railway to Harrogate; to the Stockton and Hartlepool Railway at Billingham, near Stockton, nearly 20 m., short branches, amounting to about 14 m. to the Great North of England Railways; and a line for connecting the line of the Great North of England Railways with that of the Cleveland Bridge. This last-mentioned line is called the St. Helen's branch. See also Wathwale.

Leicester [P. C., p. 263].—Acts of 1846 confirm the purchase of this line by the Midland Railway Company, and confer on the purchasers power to alter 14 m. of the line, and to open branches to Loughborough, 10 m.; to Burton-upon-Trent, 14 m.; and to Swadlincote colliery, nearly 25 m.

Lincoln and Corby. — Length, main line, 65 m.; branch to the Cheesewring, 93 m.; act passed 1843; partly opened 1844. For Burton-on-Trent branch, worked by joint stock company.

Cornwall.

Liverpool and Bury. — Original line, under an act of 1845, from Liverpool to Wigan, Bolton, and Bury, 34 m. Acts of 1846 authorise an extension of 3 m. to Tyhe Barn Street, Liverpool; a branch of nearly 1 m. from the New Springs branch to the North Midland Railway; and an amalgamation with the Manchester and Leeds.

Liverpool and Manchester [P. C., p. 263].—The junction line referred to above is connected with the main line of the Liverpool and Manchester Company by a branch completed in May, 1844. An act of 1845 authorises a new entrance into Liverpool, and a branch to join the Manchester, Bury, and Rossendale line at 50 m. Another act of the same session ratified the amalgamation of the Liverpool and Manchester, with its connections, the Bolton and Leigh and Kenyon, the Great Central Railway, from which it is said to be merged in the London and North-Western.

Liverpool, Manchester, and Newcastle-upon-Tyne Junction. — Main line, from the Leeds and Bradford Railway at Eaket, to the Richmond branch of the Great North of England Railway at Scoiton, 474 m.; branch to Hawes, over 9 m.; act passed 1846. This undertaking comprises the main line of the Leicestershire and North Yorkshire Railway, and, in the Hawes branch, a portion of that projected by the Liverpool, Manchester, and Newcastle sponson, the two lines having been consolidated while before parliament. The Hawes branch, being identified with part of the York and Glasgow Union projected line, is not to be made if that line be, as intended, constructed by the Northern Counties Union Railway Company, which see. The capital is partly subscribed by the Manchester and Leeds Railway Company.

Liverpool, Ormskirk, and Preston. — Main line, from the Liverpool and Bury Railway at Walton-on-the-Hill to the North Union Railway at Penwortham, 234 m.; branch to the Blackburn and Preston Railway, nearly 24 m.; branch to Blague-Gate Collieries, 3 m.; branch to the junction of Walter Street and Regent Street Junction, Part of the total 29 m. Amalgamated with the East Lancashire Railway.

Ludlow [P. C., p. 264].—The total length of this line and its branches is 8 m. for evidence before the Gauge Commissioners (Q. 6041), is 45 m.

Luce and the Vale. — From London to Margam; length 15 m.; act passed 1846. As it joins the South Wales Railway, this line is to be laid on the broad gauge. The company has amalgamated with the Duffryn-Llwyd and West-Gower Railway Company.

London and Birmingham. — First act of 1843 this company has made a branch of 474 m. from Bishworth, by Northampton, to Peterborough, which was opened in June, 1845. It was not until 1846 that the London and Birmingham Railway Company started the numbering of these companies, under the comprehensive title of the London and North-Western Railway Company. Acts of 1846, for the extension of nearly 1 m. at Birmingham, to near Navigation Street; a branch of 104 m. to the London and Birmingham Company near Coventry, to the Trent Valley Railway at Nuneaton; an extension of 1 m. at Leamington; and a line of nearly 6 m. from their main line at Wedon to the Northampton and Pecknall line at Northampton, and to enlarge their stations at London, Rugby, and Coventry. For other connections and arrangements (enumerated here, rather than under the title of London and North-Western, because they have for the most part been made by the London and Birmingham Railway Company, and are under separate acts) see Bedford and London and Birmingham; Birmingham, Leicestershire, and Manchester; Birmingham, Wolverhampton, and Stafforshire; Nottingham, Lincolnshire; Coventry; Leamington; Birmingham, Leicester; Stratford and Birmingham; Shrewsbury and Birmingham; Shrewsbury and Hereford; Shropshire Union; etc.

London and Blackwall (formerly Commercial) [P. C., p. 264].—Extension line of 3 m. to near Fenchurch Street opened 1843. In August, 1844, the London and Blackwall extension, from Stepney to Fenchurch Street, to accommodate the traffic expected from the Eastern Counties Railway by the London and Blackwall East Junction Railway, was purchased by the London and Blackwall Company. The East and West India Dock and Birmingham Junction line will join the London and Blackwall Railway, and the eastern junction line of 15 m. between the London and Blackwall Railway at Stepney and the Eastern Counties Railway at Bow. Act passed 1845, since which the line has been sold to the London and Blackwall Railway Company, which see.

London and Brighton [P. C., p. 264].—The main line, of 414 m., from near Croydon to Brighton, was completed in September, 1841; the Shoreham branch, of 24 m., in May, 1845. The other branches mentioned in P. C. were abandoned, but are replaced by branches granted in 1846 in connection with the Brighton, Lewes, and Hastings line. The 12 m. between the Croydon Railway and Reigate or Redhill, is worked over by the Brighton and South Coast Railway; the companies joint, and at its cost having been repaid by the South-Eastern Company, which see, to maintain the southern half of that portion of the line. The London and Brighton and Buxton Railway Company have purchased the Brighton and Chichester Railway, with its Portland and Lewes and Hastings, Brighton, Lewes, and Hastings Railway, which see for new branches authorised in connection with them. In 1845 they obtained an extension of 23 m. to Shoreham, and another of 4 m., partly following the course of the abandoned Shoreham Iron Railway, from Croydon to the London and South-Western Railway at Wandsworth, and for confirming an amalgamation with the London and Croyden see.

London, Brighton, and South Coast. — This is the new name of the London and Brighton Railway Company, with its branches to Hastings, Chichester, and Portsmouth, as above mentioned, conferred by the act—which amalgamates it with the London and Croyden.

London and Croyden [P. C., p. 264].—The Company have purchased the Croydon and Epsom Railway (which see), and Acts of 1846 authorise the construction of the Croydon and Epsom Railway. The line is to run from its main line to Epsom, and in 1846 they obtained another for a branch of 69 m. from the main line to East Grinstead, and a branch or extension of 64 m., partly following the course of the abandoned Shoreham Iron Railway, from Croydon to the London and South-Western Railway at Wandsworth, and for confirming an amalgamation with the London and Croyden see.
Greenwich Railway to Gravesend. The London Bridge station was opened by the London, Greenwich, and South-Eastern Railway Companies.

**London and North-Western.** Under this new title, by an act of 1846, the line is extended from the Manchester and Liverpool Railway to Hazel Grove via Stockport, and a branch to Congleton, with an extension to Macclesfield, via Sandbach and Northwich, to the Manchester and Liverpool Railway, at Crewe, which was completed and opened in 1847.

**Manchester, Ashton-under-Lyne, and Manchester Railway.** By an act of 1846, the company is formed to construct a line from Manchester to Ashton-under-Lyne, with a branch to Stockport, and a junction with the Manchester and Liverpool Railway at Stockport. The line was opened in 1848.

**Manchester and Bolton.** By an act of 1846, the Manchester and Bolton Railway Company was formed to construct a line from Manchester to Bolton, with a branch to Rivington and Hindley.

**Manchester and Leeds.** By an act of 1846, the Manchester and Leeds Railway Company was formed to construct a line from Manchester to Leeds, with branches toBradford and Halifax.

**Manchester and Liverpool.** By an act of 1846, the Manchester and Liverpool Railway Company was formed to construct a line from Manchester to Liverpool, with branches to Warrington and Northwich.

**Manchester and Stockport.** By an act of 1846, the Manchester and Stockport Railway Company was formed to construct a line from Manchester to Stockport, with a branch to Stockport and Macclesfield.

**Manchester and Warrington.** By an act of 1846, the Manchester and Warrington Railway Company was formed to construct a line from Manchester to Warrington, with branches to Lyme and Northwich.

**Manchester and Wigan.** By an act of 1846, the Manchester and Wigan Railway Company was formed to construct a line from Manchester to Wigan, with branches to Leigh and WN. The line was opened in 1846.

**Manchester and Whitchurch.** By an act of 1846, the Manchester and Whitchurch Railway Company was formed to construct a line from Manchester to Whitchurch, with branches to Macclesfield and Congleton.

**Manchester, Ashton-under-Lyne, and Manchester Railway.** By an act of 1846, the company is formed to construct a line from Manchester to Ashton-under-Lyne, with a branch to Stockport, and a junction with the Manchester and Liverpool Railway at Stockport. The line was opened in 1848.

**Manchester and Southport.** By an act of 1846, the Manchester and Southport Railway Company was formed to construct a line from Manchester to Southport, with a branch to Lytham.

**Manchester and Stockport.** By an act of 1846, the Manchester and Stockport Railway Company was formed to construct a line from Manchester to Stockport, with a branch to Stockport and Macclesfield.

**Manchester and Warrington.** By an act of 1846, the Manchester and Warrington Railway Company was formed to construct a line from Manchester to Warrington, with branches to Lyme and Northwich.

**Manchester and Wigan.** By an act of 1846, the Manchester and Wigan Railway Company was formed to construct a line from Manchester to Wigan, with branches to Leigh and WN. The line was opened in 1846.

**Manchester and Whitchurch.** By an act of 1846, the Manchester and Whitchurch Railway Company was formed to construct a line from Manchester to Whitchurch, with branches to Macclesfield and Congleton.
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nearby 1 4 m. to the proposed Nottingham and Mansfield line, making the total length of the line 34 8 m. in all. The line makes several short branches, amounting to about 24 m. 3 from the Erewash Valley Railway, which they have purchased; to make a line, called the Erewash Valley Railway to connect the several branches elsewhere described in connection with it; to make a railway of 162 m. from Nottingham to Mansfield; and to purchase and close the Oakham Canal, which branches of which will be diverted by the Syon and Peterborough line. In addition to the above lines the companies have purchased or leased the Britoil and Birmingham, Leeds and Bradford, and Northern Railways, which see. *Midlands Counties [P.C, p. 264.]-Merged in the Midlands Railway, which see.

Monmouth Branch.-See South Wales.

Monmouth and Hereford.-Main line 22 m.; branch to Westbury 10 m.; branch to the Forest of Dean 44 m.; total 264; act passed 1845. Projected as an extension, upon the broad gauge, from the Cheltenham and Great Western line at Standish, but (see South Wales) the works proceeded for the crossing, but have not been sanctioned by Parliament in 1845 or 1846. The line has been purchased by the Great Western Railway Company.

Moseley.-The line, 9 m., in existence since 1846, is made up of m. 3 from Newport and Pontypool. To be made by the Monmouthshire Canal Company; length, 13 m.; act passed 1845. See Monmouthshire.

Newport and Crewe.-See Shropshire Union.

Newport and Chester.-The company incorporated under this title in 1846, which is in friendly relation with the London and North-Western, and may probably be united with it, obtained three miles of the Symonds: respecting, respectively, the Great Western line, of nearly 45 m., from the Macclesfield branch of the Manchester and Birningham line at Macclesfield to the Birmingham and Derby line at Wellington, with the Burton-upon-Trent termination, nearly 4 m., and a branch of 164 m. from Uttoxeter to the Potteries line near Stoke-upon-Trent, making together 248 m.; the Potteries line, of 264 m., from the same point at Macclesfield to the Trent Valley Railway at Colwich, with the Crewe branch, 84 m., the Newcastle-under-Lyme branch, 44 m., and the branch to join the Grand Junction line at Northwich, farther than 84 m., making together about 54 m.; and a line from the Potteries line at Harecastle to the Manchester and Birningham Railway at Sandbach, about 8 m.; making together about 34 m. The company abandoned the line before the latter act. The Company is empowered to purchase the Trent and Mercury Canal.

North Union.-Formed by the consolidation of the Preston and Wigan Branch Railways. The act of 1846 confirms the amalgamation of the Blackburn and Preston with this undertaking; and one of 1846 sanctions an extension of the line from the Wigan Branch to the Grand Junction (now merged in the London and North-Western) and the Manchester and Leeds Railway Companies jointly.

North Wales & Ribble Navigation.-From the North Union Railway to the Victoria Quay, Preston, 4 m.; act passed 1845. To be made by the North Union Railway and Ribble Navigation Company; length, 33 m.; act passed 1845. See Corwen.
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Lines adopted, the course of the latter from Thirsk to Clifton and a portion of the former from Bishop's Auckland to Teesby.
Northern Union.—See Newcastle and Darlington Junction.
Norwich and Brandon.—By the original act of 1843 this was to be a general way; the work was begun in August, 1845, and an act of 1845 the main line was diverted to pass through Thetford, making the length about 40 m. Opened July, 1845. Amalgamation with the Norwich and Brandon Railway, which see. The 1845 act allows a branch of 11 m. from Wymondham to East Dereham. Not on present map.—See Midland.
Nottingham and Mansfield.—See Midland.
Oxford Branch.—See Basinghamshire.
Oxford Branch.—From the Great Western Railway at Didcot to Oxford, 94 m. and opened June, 1844. Made by the Great Western Railway Company. Gauge 7 feet.
Oxford and Rugby.—From the Oxford branch of the Great Western Railway at Oxford to the Birmingham and Midland Railways at Rugby, length 503 m.; act passed 1845. Sold to the Great Western Railway Company, who are constructing it as a broad-gauge line. See Birmingham and Oxford Junction Railway, and also the account of the gauge controversy, p. 665.
Oxford, Worcester, and Widerhampton.—The original act, passed in 1844, was for a main line of 264 m. in extension of the Oxford branch of the Great Western Railway, with the Worcester branch, 14 m.; the Stoke branch, 4 m.; the Stourbridge branch, 1 m.; and the Stratford-upon-Avon branch, 134 m., the whole line making the length of 286 m. in total 1014 m. An act of 1846 provides for some alterations in the line, and a branch of 9 m. to Stratford-upon-Avon, one of 44 m. to Wilmcote, and a connection of 134 m. of new line. The line is being constructed for the broad gauge, and under a guarantee from the Great Western Railway Company, but provision is made in the original act for paying additional rails where the connection with narrow-gauge lines may render it necessary in order to avoid a break of gauge. (See remarks on the gauge question, p. 655.) The company have leased the Stratford and Moreton Railway, and the act of 1846 gives power to purchase the Stratford-upon-Avon and Stourbridge branches, the former of which they will transfer to the Birmingham and Oxford Junction Railway Company.
Oystermouth.—[P. C. p. 264.]
Pondgate and South Shields.—A private company, formed about 1831 or 1832, constructed, without the authority of an act of parliament, an extensive line called the South Shields and Tynemouth Railway, running for about 34 m. from South Shields, through the northern part of the county of Durham, to Tynemouth, which was worked, at least partially, by locomotive engines, and used principally for coal traffic. It proved an unsuccessful speculation; and in 1842 a new company was incorporated by act of parliament for working a portion of the line, the old company being dissolved. In 1844 the new company, which took the name of the Pondgate and South Shields Railway Company, obtained an act for widening a part of the line from Pondgate Junction to the branch of 4 m. to the Brundling Junction Railway; and under an act of 1846 the whole undertaking has been consolidated with the Newcastle and Darlington Junction, now the York and Newcastle Junction Railway.
Portland.—[P. C. p. 264.]
Poulter Pier and Railway.—The act, passed in 1846, is for widening a pier at Portland, and a railway of nearly 4 m. with a branch of nearly 1 m., to connect it with the Bristol and Exeter line near Bristol, to be laid on the broad gauge, and may be leased to the Great Western or Bristol and Exeter Railway Company.
Portsmouth.—See Brighton and Chichester, Portsmouth Extension; Direct London and Portsmouth; and Guildford Extension, Portsmouth, and Fareham.
Potters Line.—See North Staffordshire.
Preston and Edinburgh.—[P. C. p. 264.]
Preston and Wirral.—[P. C. p. 265.]
Preston and Wyre.—[P. C. p. 265.]
Preston and Wyre.—An act of 1845 authorizes branches to Blackpool, 35 m.; to Lytham, about 43 m.; and to Thornton-Cleveleys, 10 m. The work was commenced in April, 1846. An act of 1846 sanctions the amalgamation of the Preston and Wyre Railway, Harbour, and Dock Company with the Corporation of the Borough of Preston, the latter of which have the option of purchasing the portion between Rickegate and Docking. By a proposed arrangement with the Direct London and Portsmouth Railway Company for the use of part of their line, the construction of about 11 m. of this line may be avoided.
Redruth and Chassewater (or Dewern).—[P. C. p. 265.]
Redruth, Cornwall.—From the London and South-Western Railway at Battersea, through Woodworth and Putney, to Richmond, length 6 m.; act passed 1846. Sold to the London and South-Western Railway Company.
Royston and Hitchin.—Length, about 12 m.; act passed 1846. This is the only part of the extension line of the Camberley and Oxford Railway, a far more extensive project. It is proposed to extend the line from Royston to Cambridge, and to lease or sell it to the Great Northern Railway Company. Sold to the London and South-Western Railway Company.
Rugby and Leamington.—Length 142 m.; act passed 1846. This line, which was projected to extend to Warwick, has been sold to the London and Birmingham Company, and the provision of a station at Rugby it constitutes.
Rugby and Stamford.—From the Rugby station of the London and Birmingham Railway to the System and Peterborough line of the Midland Railway near Stamford; length nearly 30 m. The act, which was passed in 1846, was obtained by the London and Birmingham Company, and a station at Rugby it constitutes.
Salisbury Branches.—See London and South-Western.
Sandhurst.—[P. C. p. 265.]
Sandhurst.—In 1842 the company obtained an act for an extension of the line from the town of Eton to the town of Sandhurst, amounting together to 34 m., for mineral traffic and horse-power. See Eton, Sandhurst, and South Wales.
Selby Market Vice.—See York and North Midland.
Severn and Wye—[originally Lye-didbrook.]
Sheffield, Ashton-under-Lyne, and Manchester.—[P. C. p. 265.]
Sheffield, Ashton-under-Lyne, and Manchester.—The main line, and a branch of 24 m. to Ashton, made under an act of 1844, were completed in December, 1845. Acts of 1846 sanctioned branches of 1 m. to Dukfieldfield; of 1 m. to Glossop (this branch having been made without parliamentary powers, and opened in 1845); of 124 m. to Whaley Bridge, and of 24 m. to Hayfield; the purchase of the Peak Forest and Mex-}

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a branch of 4½ m. to Coalbrook Dale, making a total of 34 m. These lines form part of a much more extensive scheme, the objects of which are to be attained by means of complicated arrangements, which led to the formation of the South Staffordshire Junction Railway Company (with which this company is amalgamated or united for the purpose of making the line granted to the tramway between Shrewsbury and Wolverhampton as much of the line granted to the other company, as lies between Titterhall and Wolverhampton), the Birmingham, Wolverhampton, & Wolvercote Tramway Company, and the Shropshire Union Railways and Canal Company. All of the lines granted to these companies may be regarded as parts of a system of communications connected with the London and North-Western Railway.

Shrewsbury and Chester.—This is the title given by an act of 1842 to the line from Shrewsbury to Chester Junction and the North Wales Mineral Railways, which see.

Shrewsbury and Hereford.—Length, 10½ m.; act passed 1845. Fostered by a local board of trade, it was an original project of the Great Western Railway Company, in opposition to a similar line promoted by the Great Western Railway Company.

Shrewsbury, Chester, and Chester Junction.—From Shrewsbury to the North Wales Mineral Railway at Cefn Mawr, with branch to Oswestry; length 23½ m.; act passed 1845. Acts of 1844 to 1847, for tramway and railway respectively, for the formation of a tramway and railway between Shrewsbury and Chester Junction, and the North Wales Mineral Railways, under the name of the Shrewsbury and Chester Railway.

Shrewsbury and Chester.—See Shropshire Union Railway and Canal Company, and South Staffordshire Junction Railway.

Shrewsbury and Chester, and Shrewsbury and Chester Junction.—Length, main line from Shrewsbury to Wolverhampton, rather over 29½ m.; branch at Shrewsbury, nearly 1 m.; act passed 1846. Under the form of a horse tramway, a branch to Oswestry was proposed to be connected with the Shrewsbury and Chester Railway, a considerable portion of this line will be abandoned, the two companies uniting to execute certain portions of the works projected by each.

Shropshire Union Railways and Canal.—Three acts were obtained in 1846 by a company with the above title, authorizing, respectively, the formation of a railway of nearly 46 m. from the Chester and Crewe branch of the Grand Junction Railway, at Calveley, to Wolverhampton, called the Chester and Wolverhampton Railway Company, and an additional power to purchase and to convert part of it into a railway; the formation of a main line of railway of nearly 60 m. from Newtown, in the county of Hereford, to Oswestry, with branches to Ellesmere, Wem and Whitlock, and one at Crewe, amounting to 7½ m.; and the formation of a main line of railway of rather over 39 m. from Shrewsbury to Stafford, with a branch of 1½ m. to Stone, including power to purchase the Shrewsbury Canal. The aggregate length of the above lines is rather over 155 m., but the company are restricted from making that portion of the last-mentioned line which lies between Shrewsbury and Wellington, in case either the Shrewsbury and Birmingham or the Shrewsbury, Wolverhampton, and Staffordshire Railways should obtain their act, which both did, although, as explained under Shrewsbury and Birmingham, only part of the scheme of each is to be executed. Arrangements were also made for the leasing the whole of the above undertakings to, or the amalgamation of the company with, the London and North-Western Railway Company. The Shrewsbury and Chester Junction Railway Company possess an interest in the Shropshire Union.

Sirkewy.—[P. C., p. 265.]

South Eastern.—The Bristol and Exeter Railway at Exe- ter to Plymouth; length, about 54½ m., exclusive of a branch of about 2½ m. to Mill Bay, and an alteration of about 2 m. of the Plymouth and Dartmouth Railway, which the company are empowered to lease or purchase; act passed 1844; gauge 7 feet. Intended for working by atmospheric power; but 15 m., from Exeter to Exmouth, was obtained under an act of 1846, was empowered to be leased or purchased, and was taken over by the Plymouth and Devonport Company. The act of 1846 sanctions a branch of 5 m. from Aller, near Newton, to Torgusy; a deviation of the main line near Newton, to Wolmerhampton, as already authorized in the town of Plymouth and Devonport. Part of the capital for this line was subscribed by the Great Western, Bristol and Exeter, and Bristol and Gloucester Railway Companies, which are empowered to lease it; and the South Devon Company possesses an interest in the Ashburton, Newton, and South Devon and the Cornish line.

South-Eastern.—[P. C., p. 265.]

South-Western.—The Bristol and Exeter Railway at Exeter to Plymouth; length, about 54½ m., exclusive of a branch of about 2½ m. to Mill Bay, and an alteration of about 2 m. of the Plymouth and Dartmouth Railway, which the company are empowered to lease or purchase; act passed 1844; gauge 7 feet. Intended for working by atmospheric power; but 15 m., from Exeter to Exmouth, was obtained under an act of 1846, was empowered to be leased or purchased, and was taken over by the Plymouth and Devonport Company. The act of 1846 sanctions a branch of 5 m. from Aller, near Newton, to Torgusy; a deviation of the main line near Newton, to Wolmerhampton, as already authorized in the town of Plymouth and Devonport. Part of the capital for this line was subscribed by the Great Western, Bristol and Exeter, and Bristol and Gloucester Railway Companies, which are empowered to lease it; and the South Devon Company possesses an interest in the Ashburton, Newton, and South Devon and the Cornish line.

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South-Eastern.—[P. C., p. 265.]

South-Western.—The Bristol and Exeter Railway at Exeter to Plymouth; length, about 54½ m., exclusive of a branch of about 2½ m. to Mill Bay, and an alteration of about 2 m. of the Plymouth and Dartmouth Railway, which the company are empowered to lease or purchase; act passed 1844; gauge 7 feet. Intended for working by atmospheric power; but 15 m., from Exeter to Exmouth, was obtained under an act of 1846, was empowered to be leased or purchased, and was taken over by the Plymouth and Devonport Company. The act of 1846 sanctions a branch of 5 m. from Aller, near Newton, to Torgusy; a deviation of the main line near Newton, to Wolmerhampton, as already authorized in the town of Plymouth and Devonport. Part of the capital for this line was subscribed by the Great Western, Bristol and Exeter, and Bristol and Gloucester Railway Companies, which are empowered to lease it; and the South Devon Company possesses an interest in the Ashburton, Newton, and South Devon and the Cornish line.
of less than 1 m. The gauge of the line is a ft. 8½ in. See Abber- 
dore.

Tow Vale [P. C. p. 265].—An amendment act passed in 1845; and in 1846 the company obtained powers for extending the line to Crendon: to be named the Oxford, Buckingham, and Reading Railway, at a distance of nearly 31 m. An arrangement for leasing the line to the Bristol and Exeter Railway Company has been completed.

Tetsy, Sandersfoot, and South Wales.—The act, passed in 1846, is for "making a Railway to connect the Sandersfoot Rail- way with the Harbour of Sandersfoot, and with the Town of Tenby." Main line, from the South Wales Railway at Reynalton to Tenby, nearly 63 m.; branch to Pwllheli, 2 m.; and connection with the South Wales Railway, 2 m. The act gives power to purchase the Sandersfoot Railway and Harbour.

Waves Haven Dock and Railway [P. C. p. 265].—This project has not been carried into effect; but in 1846 the company obtained an act for continuing their powers for a further period of five years, the carrying it having been obtained in 1845.

Trent Valley.—From the Grand Junction Railway near Staff- ford to the London and Birmingham Railway at Rugby; length, 49 m.; act passed 1845. Sold to the London and North-Western Railway Company, and merged in the London and North-Western Railway.

The Vale of Midland and Grand Junction.—Main line, from Wallsall to the Midland Railway at Walshe Ford, in Ta- terhill, 161 m.; branch to join the Trent Valley Railway at Lichfield, 6 m.; act passed 1845. This line is part of a main London and Manchester line which will be supplemented by other lines, is amalgamated with the South Staffordshire Junction, under the name of the South Staffordshire Railway.

The Vale of North-Western.—From the Vale of Lea to the Vale of South-Eastern.

Vale of Neath.—Main line, from the South Wales Railway, near Neath, to Merthyr Tydfil, nearly 223 m.; four branches, one of which, the branch to Neath, is one of the most important. Act passed 1846. To be laid on the 7½ feet gauge, as a branch of the South Wales Railway, to the proprietors of which it may be leased or sold.

Wakefield, Pontefract, and Goole.—The original act, passed in 1845, is for a line from the Manchester and Leeds Railway at Wakefield to Pontefract and Goole, with some short branches, amounting altogether to 283 m. Others, obtained in 1846, sanction the construction of a jetty and other works at the port of Goole, and power to branch lines amounting to about 15 m., consisting of the Methley branch, of nearly 44 m.; the Askern branch, 104 m.; and the Oakeshaw branch, of rather over 4 m. The line is to be amalgamated with the Manchester and Leeds Railway.


Warwich and Leamington Union.—From the London and Bir- mingham Railway at Coventry to a point about midway between Warwich and Leamington; length rather under 9 m.; act passed 1845; opened December, 1844. Sold to, and made by, the London and Birmingham Railway Company.

Warley.—From the Bishop's Auckland and Wearhead Railway to Frosterley, with a branch to Bishopsgarth; total length 11½ m.; act passed 1846. The line is to be built by the Bishop's Auckland and Wearhead Railway, with its short connected lines for mineral traffic, the Wear and Derwent, and Wearhead Extension Railways; and the Bishop Auckland and Wearhead Railway Act, which is to establish a more direct connection between the Bishop's Auckland and Wearhead and the Stockton and Darlington railways than that afforded by the Black Boy branch. The three last-mentioned undertakings have been executed without parliamentary powers.

Weardale Extension.—See Wear Valley.

Wexford and Northampton.—See London and Birmingham.

West Cornwall.—Main line, from the parish of Krynwo to Penzance, nearly 26 m.; branch from near Redruth to the Corn- wall Railway near Penzance, to complete the communication between Falmouth and Penzance, 5½ m.; total, about 313 m. To be laid on the broad gauge. The act, passed in 1846, gives powers to build this line.


West London (formerly Birmingham, Bristol, and Thames Junction).—The main line was laid down with a single track, but three rails, forming a double gauge, and worked by locomotive engines. Laid for 999 years to the London and Bir- mingham Railway line; and the company are authorised to obtain an act jointly in 1846 for altering about 1 m. of the line, and extending it nearly 3 m. to the river Thames at Chiswell.

Whaleysdale.—From Skipworth to the Leeds and Thirsk Railway at Archington, 21 m.; and two short branches, one at Skipworth, and one to form a second junction with the Leeds and Thirsk line, about 1 m. total 23 m.; act passed 1846. It was proposed to lease this line to the London and North-Western Railway; but the Yorkshire North-Eastern Railway, and intended to extend to York, to the Leeds and Thirsk Railway Company; but (Novem- ber, 1846) the tenements have been secured for an extension to Whitby and Pickering [P. C. p. 265].—Purchased by the York and North Midland Railway Company, who obtained an act in 1845 for a tunnel through the mountains of Yorkshire in order to extend to York in 1846 for an extension of about 103 m. to near Castleton.

Whitehaven and Furness Junction.—Crosses the Duddon sands; length, with two branches, 8 m.; act passed 1844. The act passed 1845. An act of 1846 allows a deviation of nearly 3 m. at Kirkcudart; an extension of 5 m. at Whitehaven, to join the Whitehaven and Port Carlisle Railway; and the line is to be under- taken to the Whitehaven Junction Railway Company.

Whitehaven Junction.—From the Maryport and Carlisle Rail- way at Maryport, along the coast, to Whitehaven; length 22 m.; act passed 1844; part opened 1846. See Whitehaven and Furness Junction.

Wigan Branch [P. C. p. 265].—See North Union.

Wilt, Sommerset, and Weymouth.—Under the original act of 1845 this railway is to extend from Corsham, on the Great Western Railway, by two main branches, amounting to about 96 m., with smaller branches to Devizes, 7 m.; Bradford, 1½ m.; Radstock, 9 m.; Sherborne, 4 m.; and Bridport, 1½ m.; total 129 m.; but an act of 1845 authorises a second branch from the Devizes and Bradford, and the whole to nearly 363 m., of which length about two-thirds is to replace parts of the original scheme which have been abandoned. The additions are:—from Corsham to Devizes, 6 m.; from Sherborne to Melcombe Regis, 2 m.; and from the Weymouth extension, nearly 1 m.; the Salisbury extension, 2½ m.; the Devizes branch (substituted for that of 1845), 6½ m.; and the branch to Yeovil, 1½ m.; the Laycock devi- sion and junction extension, 1 m.; the Weymouth extension, nearly 3 m.; the Weymouth extension, nearly 1 m.; the Salisbury extension, 4½ m.; the Devizes branch (substituted for that of 1845), 6½ m.; and the branch to Yeovil, 1½ m.; the Laycock devi- sion and junction extension, 1 m.; the Weymouth extension, 3 m.; the Fovant deviation, 6½ m.; the Red- stock branch deviation, 1 m.; and the Herringstone deviation, 4 m. The undertaking was projected in connection with the Great Western Railway Company, whose gauge is to be adopted.

Windsor, St. Ives, and Cambridge Junction.—Main line, from Wobbech to St. Ives, 271 m.; branches to head of railway at Cambridge, 18 m.; and bridge and Huntingdon line of the Eastern Counties Railway at Penny-Drayton, 1½ m.; total 29 m.; act passed 1846. Sold to the Eastern Counties Railway Company.

Yarmouth and Norwich.—Act passed 1842; opened May, 1844. Length 20½ m. Amalgamated with the Norwich and Brad- waxdon, under the name of the Norfolk Railway, which see. See also Lowestoff. The amalgamation act of 1845 sanctioned an extension of about 4½ m. at Norwich. The connection with the Brandon line near that city by a movable bridge over the Wes- sum was completed in December, 1845.

Yewell Branch.—See Britoil and Exeter.

York and Beverley.—See York and North Midland.

York and Beverley.—See York and North Midland.

York and Newcastle Union.—This is the name given by an act of 1846 to the Newcastle and Darlington Junction Railway, with the Great North of England, and other lines now associated with it. According to a statement annexed to the act, the company, in October, 1846, agreed on the length of the lines beyond to this company, or which they have power to construct, is about 225 m.

York and North Midland [P. C. p. 265].—By an act of 1844, this company was empowered to make a line of about 42 m. from York to Scarborough, with a branch of 6½ m. to Pickering. The Scarborough branch, an alteration of which for 8 m. near York was sanctioned by an act of 1845, was opened in July of that year. Other acts of 1845 authorises a branch of 191 m. from the York and Scarborough line to Bridlington, which was opened as far as Filey, about 6 m., in October, 1846; and a branch of 194 m. from their main line to Harrogate. Acts of 1846 authorises the York and Beverley Railway of rather over at m. to the East Dock branch of 4 m., making together 35 m.; the Selby and Market Weighton branch of 16 m. with the Hornsea branch of 194 m.; together making a new line of 260 m. of direct communication between York and Leeds; the widening and en- largement of about 138 m. of the original York and North Mid- land line, and the extension of the main line, 14 m., with an additional new line of about 138 m. of the original York and North Mid- land line, and the extension of the main line, 14 m., with an additional new line of about 138 m.
RAILWAYS OF SCOTLAND.*

Aberdeen.—From Aberdeen to the Aberroth and Forfar line at Fyvie, 492 m.; branch to form a second junction at Guthrie, 50 m.; and to Montrose, 56 m.; branch to Brechin, 58 m.; and to Arbroath, 58 m.; act passed 1845. To lease the Arbroath and Forfar Railway. See also Duntoit.

Arbroath and Forfar. [P. C., p. 265.]—An act of 1846 sanctions the leasing of the line to the Aberdeen Railway, in consequence of which the gauge will be widened to 4 ft. 8½ in., and a second track will be laid.

Ardsrossan (formerly Johnstone and Ardsrossan). [P. C., p. 265.]*—Gauge originally 4 ft. 6 in., but altered to 4 ft. 8½ in., for railway, together with the harbour of Ardsrossan, has been sold to the Glasgow, Kilmarnock, and Ardrossan Railway Company.

Ayrshire and Bridge of Weir.—From the Glasgow, Paisley, Kilmarnock, and Dunbartonshire Railway Company. [Balloch, p. 265.]*—Gauge originally 4 ft. 6 in., but altered to 4 ft. 8½ in., under an act of 1845. See Monkland and Clydesdale Junction. See also Glasgow, Balloch, and Helensburgh Direct; Glasgow, Kilmarnock, and Ardrossan; Glasgow Southern Terminal, and Scottish Central. The company also proposes to amalgamate with the Glasgow, Paisley, and Greenock.

Caledonian and Dumfriesshire Junction.—According to the title of the act, which was passed in 1846, this is a railway 'from Glasgow, Kilmarnock, and Lochmaben, to Briggend, and to Kilmarnock, and the purchase of the Glasgow, Garnkirk, and Coatbridge line, are sanctioned; and the Caledonian Company are empowered to devote their line to it; to devote about 3 m. of the Clydesdale Junction line; to form short branch and terminal railways at Glasgow, amounting to about 2 m.; and to make branches amounting to 14 m. from their Cessnock railway to Garnkirk, and to Coatbridge Railway. See also Glasgow, Barrowhall, and Neilston Direct; Glasgow, Kilmarnock, and Ardrossan; Glasgow Southern Terminal, and Scottish Central. The company also proposes to amalgamate with the Glasgow, Paisley, and Greenock.

Caledonian and Dunbartonshire Junction.—From the Paisley and Glasgow Railway Company, whose line it joins at Dunblane. See also Glasgow, Paisley, Kilmarnock, and Ayr.

Edinburgh and Arbroath. [P. C., p. 266.]*—Gauge to be altered to 4 ft. 8½ in. An act of 1846 authorizes a branch to Broughty Ferry Castle, and another to the Arbroath and Forfar line at Almerieclees. Length, under 14 m.

Dundee and Arbroath. [P. C., p. 266.]*—Leased to the Dundee and Arbroath Company, with the Arbroath and Forfar line at Almerieclees. Length, under 14 m.

Dundee and Broughty Ferry. [P. C., p. 266.]*—Original gauge 4 ft. 6 in.; act passed 1846.

Dundee and Perth.—Length, 204 m.; act passed 1845. A second act, of 1846, sanctions some deviations in the line, a short extension at Perth; and the leasing or purchase of the Dundee and Broughty Ferry Railway.

Dumblane, Doune, and Callander.—Length 104 m.; act passed 1846. Power given to lease to the Scottish Central Railway Company, whose line it joins at Dunblane. See also Glasgow, Paisley, Kilmarnock, and Ayr.

Dundee and Broughty Ferry.—From the Edinburgh and Broughty Ferry Railway at Kirkaldy, near the railway station, to Dundee, 35 m.; act passed 1846. Length, 204 m.; controlling, 12 m.; through line, 192 m.; cost £85,000; earnings £12,000; passengers about 140,000. See also Dundee and Arbroath.

Dundee and Stobswell.—Original gauge 4 ft. 6 in.; act passed 1846. A second act, of 1846, sanctions some deviations in the line, a short extension at Stobswell, and the leasing or purchase of the Dundee and Perth Railway.

Dundrum Bridge.—See the Arbroath and Forfar Railway, and to the Edinburgh and Broughty Ferry Railway at Broughty.

Edinburgh and Broughty Ferry.—Main line, 192 m.; near the station of the Edinburgh and Broughty Ferry Railway, to Broughty Castle, 16 m.; and to Milton of Leith, 1 m.; act passed 1846. A second act, of 1846, sanctions some deviations in the line, a short extension at Broughty Ferry, and the leasing or purchase of the Dundee and Perth Railway.

Edinburgh and Leith.—Main Line, 192 m.; near the railway station of the Edinburgh and Broughty Ferry Railway, to Broughty Castle, 16 m.; and to Milton of Leith, 1 m.; act passed 1846. A second act, of 1846, sanctions some deviations in the line, a short extension at Broughty Ferry, and the leasing or purchase of the Dundee and Perth Railway.

Edinburgh and Leith.—[P. C., p. 266.]*—Opened September 15, 1845. Act of 1845 authorised an extension of 14 m. from Edinburgh to Leith, to join the North British and Edinburgh, Leith, and Granton Railways at the North Bridge, which extension was opened on December 27th, 1845. Act of 1846 authorizes the extension of nearly 6 m. from Leith to Granton Railway, on the South Queensferry. Arrangements had been made by the Directors for amalgamating with, or lessening, the Montrose, Broughty Ferry, Balloch, and Slanemans lines; the Airdrie and Bathgate Junction; the Edinburgh and Bathgate; the Glasgow, Airdrie and Dalmuir; the Linlithgowshire Midland Junction; and the Wishaw and Coltness Railways; and also the Forth and Clyde Canal; but in September, 1846, the canal amalgamation was broken off, and a subsequent change of directors may probably be followed by the abandonment of other contemplated arrangements. It is reported (November, 1846), that the Granton Coltness line has been purchased by this company and taken up by the Caledonian Railway Company. See also Caledonian and South North British.

Edinburgh and Hawick.—This line, branching out of the North British Railway near Newcastleton, and forming a junction at Hawick with the South Bank of the Tweed and Dalkeith line, has been amalgamated with the North British. Length, 453 m.; act passed 1845. The bill for a proposed extension to Carlisle was lost in 1845. For branches see North British.

Edinburgh, Leith, and Granton (originally Edinburgh, Leith, and Northburn). [P. C., p. 266.]*—The name was changed in 1844, by an act which authorised a new branch of 14 m. from Edinburgh station, to Leith and Granton, and one of 1 m. to Granton. The total length of the present lines is nearly 44 m. Part of the main line was opened in 1845, and the branches and tunnel to Kinghorn Street, 1846. The company proposes to amalgamate with the Edinburgh and Northern Railway Company.

Edinburgh and Northern.—By the original act of 1845 this is a main line of 304 m. from Burntisland, on the Firth of Forth, to Perth, with a branch of 24 m. to Cupar and Coupar, and one of 1 m. to Kinnoull. The line was opened in 1845, and the branch is within 15 m. of the Forth Railway. See also Perth and Dundee Railway. The line is expected to be connected with the extension of the North British Railway at Dunfermline, by a line of 10 m. to Cupar, and of 600 yards from Kinross to Pet- tycour. Another act authorizes the purchase of a line of 40 m. Another act allows the purchase of the ferry across the Tay between Ferry-Port-on-Craig and Broughty. See also Edinburgh, Leith, and Granton.

Garpkirk and Glasgow. [P. C., p. 266.]*—The original gauge of this line was 4 ft. 6 in., and not, as stated there, 4 ft. 8½ in.; but it is proposed by an act of 1844 that an act to be increased to 4 ft. 8½ in. is about to be passed, 1846; authorizing extensions to the amount of 24 m., the name of the company was changed to the Glasgow, Garnkirk, and Coatbridge Railway Company. See also General Terminus and Glasgow Harow.

General Terminus and Glasgow Harbour.—From the Pollok and Glasgow Railway to the river Clyde and the harbour of Glasgow, 1 m.; act passed 1844. Power given to lease to the joint undertaking of the Glasgow, Paisley, Greenock, and Glasgow, Paisley, Kilmarnock, and Ayr Railways, and to the Glasgow, Barhead, and Neilston Direct line; total length, under 24 m.; act passed 1846. See also Glasgow, Airdrie, and Monklands Junction.

Glasgow, Barrowhall, and Neilston Direct.—From Glasgow to Croftonhall, Neilston, and branches of 16 m. to Greenock and Dunbarton, and the Greenock Railway. Act passed 1845. Under an act of 1846 branches to Thornhillbank and Nithshill, together under 14 m., are authorised to be connected with the Glasgow, Paisley, and Neilston Direct; this undertaking is to be leased to the Caledonian. See also Glasgow, Kilmarnock, and Airdrossan, and Glasgow, Strathaven, and Lemasdale.

Glasgow and Belford Union.—From the Glasgow, Paisley, Kilmarnock, and Ayr line (to the owners of which it is to be made over by the company), to the haulage of the Thomson and Railway, between under 14 m., with a branch of 3 m. to Ayr; act passed 1846. This is only a part of a much more extensive project.

Glasgow, Dumfries, and Carlisle.—From the Glasgow, Paisley, Kilmarnock, and Ayr Railway, near Cumnock, to the Caledonian Railway, and to the crossing of the river Sark, nearly 65 m.; with branches of 1 m. to Annan, under 14 m.; to the Glasgow, and under 14 m. to Cradock, 165 m.; total, 907 m. Act passed 1846. To be nearly 114 m.; with Calder branch, nearly 24 m.; Binny quarries branch, 11 m.; Whithorn branch (from Barrack), nearly 24 m.; Whithorn branch (from Bathgate), nearly 3 m.; total, about 254 m. Act passed 1846. Leased to the Edinburgh and Glasgow Railway Company.

* In the case of several of the earlier Scotch railways the gauge is given erroneously as 4 ft. 6 in., which is not the case; it is, however, as given in the above table in which the matter is noticed, most of them were laid with a gauge of 4 ft. 6 in., and others will be too long, altered to the ordinary 4 ft. 8½ in. gauge of 4 ft. 8½ in.
amalgamated with the Glasgow, Paisley, Kilmanock, and Ayr, and the portion from Dunbarton to Grefina to be worked by the Caledonian Railway Company.

Glasgow, Garnkirk, and Coatbridge. — This railway is the line originally called the Garnkirk and Coatbridge (which see), as extended under an act of 1844 by new lines, one of which joins the Wishaw and Coltness, to the extent of 2½ m. Of these the Garnkirk and Coatbridge branch was opened in 1845, in which year an act was obtained to widen the gauge to 4 ft. 8½ in. Under three new acts of 1846 the line is termed 3½ m in connection with the Glasgow and the connection mentioned under Caledonian is sanctioned.

Glasgow Junction. — From the Edinburgh and Glasgow Railway at Portobello to the Cut of Juncton Canal, or near Broxburn, and to the north quay of the harbour of Glasgow. To be made by the Edinburgh and Glasgow Railway Company. Length, under act of 1845, 2½ m; but by an act of 1846 a length of 425 yds is to be abandoned, and a new line of 372 yds substituted for it.

Kilmarnock and Ayr. — From the Glasgow, Barrhead, and Neilston Direct Railway at Crofthead to Kilmarnock, 14 m; Ayrdoon branch, nearly 10 m; Irvine branch, Glasgow, Ayr, and Kilmaurs, and Neilston Direct Railway. See also Glasgow, Barrhead, and Neilston. To be amalgamated with the Caledonian.

Renfrew. — From the Glasgow, Barrhead, and Neilston Direct Railway near Pollokshaws to the Govan Railway. See also Glasgow, Barrhead, and Neilston. To be amalgamated with the Caledonian.

Glasgow Southern Terminus. — From the Glasgow, Barrhead, and Neilston Direct to the Caledonian Railway; length rather over 1 m; act passed 1846. Part of a more extensive project; and is to be made over to the Glasgow, Barrhead, and Neilston Direct Company.

Glasgow, Strathclyde, and Lomondshaws Direct. — From the Glasgow, Barrhead, and Neilston Direct Railway near Pollockshaws, to Strathclyde; length 1½ m; act passed 1846. Great North of Scotland. — From Aberdeen to Inverness, with branches to Balloch, Garmouth, and Beragh. Main line, 107½ m; branches, 35½ m; total length, 132½ m; act passed 1846. See Great North of Scotland; Eastern Extension.

Great North of Scotland. — From Aberdeen to Inverness, with branches to Balloch, Garmouth, and Beragh. Main line, 107½ m; branches, 35½ m; total length, 132½ m; act passed 1846. To be leased to the-locomotive. See Great North of Scotland.

Hawick Branch. — See Edinburgh and Hawick.

Johnstone and Ardrossan. — See Ardrossan.

Kilmarnock Branch. — See Glasgow, Paisley, Kilmanock, and Ayr.

Kilmarnock and Troon. [P. C. p. 266.]-The act of 1837, mentioned in P. C. note (b), was never carried into effect; but an act of 1846 sanctions the leasing of the line to the Glasgow, Paisley, Kilmanock, and Ayr Railway Company, the alteration of certain parts, the conversion of the whole into a locomotive line, and two new branches, amounting to 2½ m.

Leith Branch. — See Edinburgh and Dalkeith.

Monkland and Kirklistoloch. [P. C. p. 266.]-An act of 1845 authorised new branches amounting to about 1½ m, and one of 1846 sanctions a branch of 2 m. 1100 yds to Chapel Hall. and one of 23½ yds to the Glasgow, Garnkirk, and Coatbridge Railway. The original gauge of the line was 4 ft. 8½ in., but an act of 1845 provides for an alteration to 4 ft. 8 in. See Monkland Mineral.

Monkland Mineral. — This is the collective title of the Monkland and Kirklistoloch, Slammanan, and Ballochory Railways, which have amalgamated with one another, though without the sanction of Parliament, and have leased to the Glasgow, Ayr, and Monkland Junction line. It was agreed to amalgamate the whole with the Edinburgh and Glasgow; but as the machinery and expense of extending the arrangements out of the line mentioned (November, 1846) is very uncertain.

Morayshire. — From Stotfield and Leenshore Harbour to Elgin, Arders, and Croggaich; length 11 m; act passed 1846.

Nerlyte and Corpse Angus. [P. C. p. 266.]-Purchased by the Scottish Midland Junction Railway Company, to form part of their line.

Nerlyte and Glamis. [P. C. p. 266.]-Length, 7½ m. Purchased by the Scottish Midland Junction Railway Company to form part of their line.

North British. — Main line, from Edinburgh to Berwick 573 m; branch to Haddington, 42 m; act passed 1844; opened 1845. The act of 1845 sanctioned a branch of 1 m, opened in 1846, in which year an act was obtained to widen the gauge to 4 ft. 8½ in. Under three new acts of 1846 the line is termed 3½ m in connection with the Edinburgh and Dalkeith line; for making new branches to the extent of about 1¾ m, composing the Tranent branch, of ½ m, the Cockenzie branch, of nearly 1½ m, the North Berwick branch, of about 4½ m, and the Dunsie branch, of rather more than 9 m; and also for making new branches to the extent of about 25 m, in connection with the Hawick line, consisting of the Selkirk branch, nearly 5 m, the Jedburgh branch, nearly 7½ m; Paisley and Renfrew. [P. C. p. 266.]-Gauge, 4 ft. 6 in. Both passengers and goods. See Clyde Railway. Amalgamated, under an act of 1846, with the Caledonian Railway.

Scottish Central. — The original act, passed in 1845, was for a main line of nearly 465 m, from the Edinburgh and Glasgow Railway, by Stirling to Perth, with a branch to Falkirk, to the Kilmarnock and Ayr, and others, passed in 1846, sanction branches of 44 m, by Alloa to Tullibody; of nearly 9½ m to Crieff; and of 3½ m to Bridgeport, with branches of 3 m each, for making new branches to the extent of about 8 m, for making new branches to the extent of about 16½ m, for making new branches to the extent of about 1 m, for making new branches to the extent of about 1 m, for making new branches to the extent of about 17 m, for making new branches to the extent of about 25 m, in connection with the Hawick line, consisting of the Selkirk branch, nearly 5 m, the Jedburgh branch, nearly 7½ m; Paisley and Renfrew.

Dundas, Dalkeith, and Neilston. — See Clyde Railway.

Clyde Railway. Amalgamated, under an act of 1846, with the Caledonian Railway.

Scottish Midland Junction. — The original act, passed in 1845, was for a main line of 303 m, from Perth to Forfar, with short branches, increasing the length to 235 m, to connect it with the Scottish Central and Arbroath and Forfar Railways. An act of 1846 sanctions additional branches to the extent of nearly 16½ m, consisting of the Dunkeld branch, 8½ m, the Blairgowrie branch, 5 m, and the Kirriemuir branch, over 23 m. The company have purchased the Nerlyte and Corpse Angus and Ballochory, the Glasgow and Glamis Railways, which will be altered so as to form part of their main line. It had agreed to amalgamate with the Edinburgh and Glasgow and Scottish Central Railway Companies, before their contemplated union was broken off.

Shotts and Wishaw. — See Wishaw, Morningside, and Coltness.

Slammanan. [P. C. p. 266.]-The original projected branch to Ruthgate not having been executed, the company obtained an act in 1845 for a main line of nearly 41½ m, with two branches, to Pathhead, and to the northern terminus of the Slammanan Railway to the Frith of Forth, and thence to the town or harbour of Borrowstounness, 14½ m; and two branches to the Edinburgh and Glasgow Railway, about 12½ m., total length, 62 m. Act passed 1846. To be made by the Slammanan Railway Company, which see.

Slammanan Junction. — A line of about 1 m, to connect the Slammanan and Edinburgh and Glasgow Railways. Act passed 1844; continuing power to lease or sell the line to the Edinburgh and Glasgow or Slammanan Railway Companies. See Slammanan.

Stirling and Doonformine. — Main line, 25 m; branches from near Alloa to Tullibody and the harbour of Alloa, 32 m; total 244 m; act passed 1846. Proposed to be leased to the Edinburgh and Glasgow Railway Company. See Stirlingshire Midland Junction.

Stirlingshire Midland Junction. — Main line, from the Edinburgh and Glasgow Railway to the Scottish Central Railway, 54 m; branch to Carron iron-works, 14½ m; branch to Falkirk iron-works, 3 m; act passed 1846. Sold to the Edinburgh and Glasgow Railway Company.

Strathtay and Breadalbane. — From the line of the projected...
Perth and Inverness Railway, (a scheme abandoned for the present during the session of 1846) to Aberfeldy; length, nearly 92 m.; act passed 1846.

**Railways of Ireland.**

Belfast and Ballymoney—Main line nearly 35 m.; Carrickfergus branch 14 m.; Sandalstown branch 2 m.; total length, 38 m.; act passed 1845.

Belfast and Downhill. [P. C. p. 267.]

Belfast and County Down. From Belfast to Downpatrick 244 m.; with branches to Holywood, Newtownards, Bangor, and Donaghadee, amounting to 304 m.; total length, 462 m.; act passed 1845.

Clonmel and Thurles. From the Waterford and Limerick Railway at Clonmel, to the Great Southern and Western Railway atTZ—Caledonian Railway, with a branch from the latter to a station at Granville, in the parish of Slieve, making a total of 5 m. An agreement had been made for the sale of the whole undertaking to the Edinburgh and Glasgow Railway Company; but it is now (November, 1846) expected that a union with the Caledonian Railway Company will be substituted for the intended arrangement.

**Waterford and Limerick Railway.** (Act of November, 1846.)—The Waterford and Limerick Railway was chartered by the act of 1846, 7 m. 2 s. 3 d.; with branches to New Ross, 3 m.; total length, 25 m.; act passed 1846. Sold to the Great Southern and Western Railway Company.

Cork, Blackrock, and Passage. From Cork, through Blackrock, to Passage West; length, 64 m.; act passed 1846.

Cork and Passage. [P. C. p. 266.]

Cork, Passage, and Waterford. —Main line, 78 m.; branch to Fermoy, 18 m.; branch to Tramore, 22 m.; total length, 274 m.; act passed 1846.

Dolby. —See Dublin and Kingsmont.

Dublin and Coleraine Junction. Main line from Armagh to Portrush, 70 m.; branch to Sandilands, 13 m.; branch to Ballymoney, 43 m.; total length, 774 m.; act passed 1846.

Dublin and Kingsmont. Main line, from Drogheda to Portadown, 56 m.; branch to Navan, 171 m.; act passed 1845. An agreement was made in 1846, for selling the Navan branch to the Dublin and Drogheda Railway Company.

Dublin and Drogheda. [P. C. p. 266.]

Opened May, 1846; gauge 5 ft. 6 in. An act of 1846 authorises the Howth Branch, 83 m. long, the greater part of which was opened in July, 1846. The company has purchased the Navan branch of the Dublin and Belfast Junction, which see.

Dublin and Rathfurdburn. —Dublin to Dundrum, roughly over 3 m.; branch to Rathfurdburn, over 2 m.; total length, nearly 51 m.; act passed 1846.

Dublin and Wood Green. [P. C. p. 266.]

An extension of 12 m. to Dalkey, worked by atmospheric power, was made without an act of parliament, and opened in March, 1844. It follows the line of a tramroad constructed by the trustees of Kingstown Docks. An act of 1846 authorises a further extension of 7 m. to the bridge of Bray. See Waterford, Wexford, Wicklow, and Dublin.

Dundalk and Enniskillen. From Dundalk to the Newry and Enniskillen line at Clones, 403 m.; the remaining distance, about 30 m., from Clones to Enniskillen, to be made by the Newry Company, with provisions for its joint use by both lines; act passed 1845.

Dundalk Western. [P. C. p. 265.]

An abandonment.

Galway and Kilkenny. —Main line, 147 m.; from Kilkenny to Clonmel, 47 m.; to the east of Clonmel, 23 m.; total length, nearly 217 m. The company has obtained an act of 1846, but will probably not proceed with it in the near future.

Great Leinster and Munster. [P. C. p. 266.]

Owing to financial difficulties, the act of 1837, amended by another, and passed in 1846, was never carried into effect. The Great Southern and Western line has superseded the Great Leinster and Munster between Dublin and Cashel, 145 m., and between Cashel and Cahir, 52 m. In May, 1846, a committee was appointed to report on the remaining from Cashel to Kilkenny, about 35 m., with a branch of 4 m. to Milford; and another act of the same session authorising a branch of 31 m. from Kilkenny to Clonmel, 22 m.; from Clonmel to Carrick, 33 m.; from Carrick to Waterford, 25 m. The Waterford, Carrig, and Dublin Junction line is to be amalgamated with this undertaking under the new name of the Irish South-Eastern Railway Company.

Great Southern and Western. —The main line from Dublin to Cashel, 98 m.; branch from Monasterboice to Carlow, 34 m. For these the act of 1846, 63 s. 6 d., was obtained. A second act in 1844, allowing an extension of 77 m. to Cork, with a branch of 24 m. to Limerick. The Limerick branch, however, being identical with part of the Waterford and Limerick Railway is not to be made if that line is carried into effect. Another act passed in 1846, 45 s. 6 d., authorises a branch of nearly 11 m. to the river Lee at Cork. Of the original line, the portion between Dublin and Carlow, about 264 m., was opened in August, 1846. See also Clonmel and Cahir; Kingsmont; Enniskillen and Morgan's Point; Wexford, Carrig, and Dublin; Waterford, and Enniskillen.

Kilkenny and Great Southern and Western. —From Kilkenny to the Great Southern and Western Railway near Dodderagh; length, 90 m.; act passed 1846. Part of a much more extensive scheme carried by the Kilkenny and New Ross Railway Company, power given to lease or sell the line to the Waterford and Kilkenny Railway Company.

Kilkenny Junction. —From Kilkenny to Kilkenny, length 90 m.; act passed 1846.

Limerick, Ennis, and Killaloe Junction. Main line, from Limerick to Ennis, 160 m.; branch from Limerick to Killaloe, 10 m.; branch from Limerick to Clonmel, 10 m.; branch to Clonmel and Great Southern, 10 m.; branch to the Western line, 10 m.; act passed 1846. Completed (November, 1846) from Kilkenny to Strabane. Limerick, and Fermoy. —Main line, from the Great Southern and Western Railway (with which it gains power to amalgamate) at Fermoy; length, 90 m.; act passed 1846.

Mallow and Fermoy. —The original act, passed 1846, authorises a line of 77 m. from Mallow to Killarney and Longford, chiefly running upon the banks of the Royal Canal, which has already been undertaken by the company. Acts of 1846, 60 s. 6 d., for a branch, about 30 m., to the river Liffy, at Dublin; and a deviation of 26 m. to the southward of Mallow, and a branch of 23 m. to the river Liffy, at Dublin; and a deviation of 14 m. to the southward of Mallow.

Mountrath Junction. From the Great Southern and Western Railway at Carrow or Carraghane to Mountrath; length, nearly 29 m.; act passed 1846, for the purpose of leasing or selling the line to the Great Southern and Western Railway Company.

Mullingar and Athlone. —See Midland Great Western.

Navan Branch. —See Dublin and Belfast Junction.

Newry, Warrenpoint, and Richmoun. Main line, from Newry to Warrenpoint, 44 m.; act passed 1846.

Newry and Warrenpoint. —Main line, 44 m.; branch to Warrenpoint, 3 m.; act passed 1846.

Steeple Abbey Collieries Branch. —See Clonmel and Thorles.

Sligo and Shannon. —From Leagh Allan to Leagh Gill, in the county of Leitrim; length, 13 m.; act passed 1846.

South-Eastern. —See Irish South-Eastern.

Tambourine Hill. —Main line, 44 m.; the act, passed in 1846, gives power to amalgamate, with or lease the line to, the Great Southern and Western Railway Company.

Waterford, Carrig, and Dublin Junction. —From Waterford to Carrig; length, 80 m.; act passed 1846. Power given to lease or sell the line to the Great Southern and Western Railway Company.

Wexford, Carrig, and Dublin Junction. —From Wexford to Carrig; length, 29 m.; act passed 1846. Amalgamated with the Great Leinster and Munster under the title of the Irish South-Eastern Railway Company.

**TRANSPORT.** [MILLON. P. C.]

**TRANSPORTATION.** In Music, is a change of the original key to one higher or lower. This is generally performed, as a matter of convenience, by the accompanist, rather than the reasonable convenience, but more often to gratify the whim of the singer.

To the singer TRANSPORTATION is understood by any difficulty whatever, by which the voice is not to be strained. The accompanist is to follow the compass of the voice. To the accompanist it is far otherwise. The latter, unless playing from memory, must assign to all the notes, as regards their pitch,
TRavers, John. The author of compositions so popular, elegant, and charming as 'Haste, my Nanette,'—I, my dear, was born to-day. — When Bibo thought fit,—So Soft Cupid,—is fairly entitled to a few lines in our biographical department, though his life was void of any remarkable incident. He was educated first in St. George's Chapel, Windsor, afterwards under the celebrated Dr. Greene [GREENE, P. C.]. About the year 1725 he followed Kelway as organist of St. Paul's, Covent Garden, and subsequently filled the same situation also at Fulham. In 1737 he was appointed organist to the Chapels Royal. He died in 1758, and was succeeded in the latter office by Dr. Boyce.

Travers composed much cathedral music, but except an anthem, 'Ascribe unto the Lord,' and a 'Te Deum,' his productions for the church have fallen into disuse. We will only add, that Dr. Bunney's notion of him is neither discriminating nor just.

TRavereS, P. C.)

TREnTO, Antonio da, supposed to be the same person as Antonio Fantuzzi. He was born at Trent about the commencement of the sixteenth century; and, according to Vasari, the pupil of Peter and Valetto; and, according to Parrigiano, employed Antonio to engrave his works in wood, and he was one of the first and most eminent of the Italian wood-engravers. He appears to have initiated the cuts of Hugo da Carpi. Antonio Fantuzzi, but appears to have cut a good deal of wood, and was, for about 1530, employed by his master, taking with him many of his drawings, plates, and woodcuts, and went, it is supposed, to France, where he appeared again under the name of Antonio di Trento. He attached himself in France to Pramintico, who employed him to engrave or etch some of his works in copper; he executed also etchings after some other masters while in France. Bartch describes 37 etchings by him, but he is more celebrated for his woodcuts, which he engraved in chiaroscuro. The time of his death is not known, but it happened probably about 1560: the date on his prints reach to 1546.

Some of the woodcuts of Antonio are printed with three, others with two blocks: they are chiefly after Parrigiano, as the Twelve Apostles; St. John in the Wilderness; the Martyrdom of St. Peter and St. Paul; St. Cerf in the Temple; and others; among his etchings is one of Regulus in the Cask, after Giulio Romano.

(Vasari, Vite de' Pittori, &c.; Bartch, Peintre-Graveur; Maglier, Almanach des Artistes; &c.; Tristerni, Lexicon.)

Tretosternon, fossil genus of Cheloniidae from Tiliax forest. (Owen.)

Trevisi, or Trevisi, Girolamo da, born at Treviri in 1568, was a pupil of the son of the painter Pietro Maria Faccacchi, who was doubtless his son's instructor in the art. Girolamo, however, not wholly satisfied with the accuracy of the Venetian painters, became an imitator of the style of Raphael, and continued to a considerable extent the qualities of both schools. He lived some time in Bologna, where he painted some excellent works, especially from the story of Saint Antonio of Padua, in oil, in the cathedral. He left Bologna in consequence of the superior fame of Petronio del Vaga, then at Bologna. After painting several works in Venice, Trent, and some other places, he came to England and entered the service of Henry VIII., who employed him as architect and engineer, with a fixed salary of nearly 100L per annum. He was engaged in the capacity of engineer in the year 1544 before Bolesmghe, and was there killed by a cannon-shot, in his 36th year. There are some excellent portraits by Girolamo; they are well coloured and in an elaborate but broad manner, much in the style of the portraits by Raphael: there is a fine specimen in the Colonna palace in Rome; it is a length of a man, and is the picturesque costume of the period, holding a ring or sigaret in his hand. There are or were other pictures by Girolamo in this palace. A picture of the Madonna with various saints, which, according to Elsheimer, was painted by Girolamo, is now in the collection of Mr. Soely, in London: it was formerly in the church of San Domenico at Bologna.

There was an earlier painter called Girolamo da Treviri by whom there are still works bearing dates from 1470 to 1492: his surname according to Federici was Aviano. (Vasari, Vite de' Pittori, &c.; Ridolfi, Vite, &c.; Lanzini, Storia Piorni; TricarpeLites, a genus of fossil fruits from Shepp.

(Bowerbank.)

Trichomanes, a genus of ferae belonging to the sub-order Hymenophylaceae. These are on an elongated diliform receptacle with a cup-shaped involucre of the same texture with the frond. T. speciem is the only British species. It is extremely rare, and very beautiful. It is found in mosses, moor, and sea weeds. In texture as well as in scent it resembles some of the marine algae, and it is found to assume the samelike appearance when immersed in water after being kept perfect for a long time. It is found at Kilnarmy, Wicklow, and Toghill in Ireland, in great beauty. The soil which seems to suit it best is a mixture of loam and sand, interspersed with pieces of turf. (Newman, British Ferns; Bebbington, Manual of British Botany.)

Trichoneima, a genus of plants belonging to the
natural order Irideae. It has a regular 6-cleft perianth, with spreading segments. The 3 stigmas are bad, the lobes slender. T. columnae is the only British species; it has a solitary flower-like structure, capsular scenery, fibrous compressed leaves, the length longer than the tube of the corolla, the style shorter than the stamens. The flower is pale purple or violet, with a yellow centre. It is found in sandy places in Jersey and Guernsey. (Manual.)

TRIENTALIS, a genus of plants belonging to the natural order Primulaceae. It has a 7-parted calyx, a rotate 7-parted corolla, and 7 stamens inserted at the base of the corolla. The flowers are many-seeded, opening with a revolute fugacious valves. The seeds are invested with a reticulated tunic. T. Europaea has oblong obovate oblong leaves, a stem from 4 to 6 inches high, with the leaves mostly at the top. The flowers are on short peduncles, white, with a yellow ring. The valves of the capsules soon fall off. It is native of England and the Highlands of Scotland. (Babington, Manual.)

TRIGLA, a genus of Acanthopterygian osseous fishes, popularly known as Gurnards, and belonging to the family Loricarii in the arrangement of Cuvier. The head of Tria is mailed and angular; the opercle and almost the whole of the body is scaly; there are two distinct dorsal fins; beneath the pectorals are three detached rays; the branchiostegous membrane has seven rays, both sides; and in the front of the opercle is a spine with fine velvety teeth. The gurnards are fishes always remarkable for singularity of form, and often for brilliancy of coloring. They derive their popular appellation from a gurnard, which is the name by which they are known out of the water. In the British seas the commonest species are the grey gurnard (Trigla Gurnhardus), a silvery grey fish more or less clouded with brown and speckled with black; the red gurnard (Trigla Pinnis), of a bright rose-red colour; and the sapphire gurnard (Trigla Hirundo), a large and handsome fish remarkable for the vivid green and blue hues of the inner surface of its large pectoral fins. The two last are most abundant in the British seas. Several other rarer species are also inhabitants of the British seas. There are some beautiful small species in the Mediterranean, which also lives the flying-gurnard (Dactylopterus volitans), which differs generally from Trigla in having the fin-rays of the pectoral connected by membranes, by means of which the fish is enabled to support itself for some time in the air in the manner of the flying-fish. It is a handsome species, above a foot long. Another flying-gurnard (Dactylopterus Orientalis) lives in the Indian Ocean.

TRIGYPS. (Civil Architecture, P. C.)

TRIGONOCARPUM, a genus of Monocotyledonous fossil fruits in the coal formation of England. (Brongnart.)

TRILLIUM, a genus of plants belonging to the natural order Scrophulariaceae. It has three leaves, three flowers, and three sepal stigmas. The flower is inferior and 3-celled, the cells many-seeded. T. erectum has a large prunus-like rhizoma with thick horizontal fibres. The stem is about a foot in height, and sheathed at the base. The leaves large, acuminate, and secalis. The peduncle about half as long as the leaves, inclining to one side. The flower is large and of a dark purple. (Lindley, Flowering Plants.)

TRINCLUS, a large and remarkable group of Triodites chiefly or wholly found in the lower Silurian strata of England. (Lyell.)

TRIODIA, a genus of plants belonging to the tribe Aventinae. The glumes are from 2 to 3 flowers; the outer rachis, smooth, rounded on the back, biform with an obtuse rounded point sometimes becoming the base of a keeled awn. T. decumbens has a racemose panicule, few oval spikelets, the flowers scarcely extending beyond the glumes, without awns. The leaves flat, sheaths rather hairy. Ligule rounded, ciliate. The glumes smooth, coriaceous, and glabrous, and hiding the flower. It is found in mountain pastures in Great Britain. (Babington, Manual.)

TRIODON, a genus of plants belonging to the natural order Caprifolium. It has a calyx, with an ovate tube and a 5-parted permanent limb, with linear lanceolate permanent lobes. The corolla is tubular, almost equally 3-lobed, gibbous at the base, and longer in the calyx, and the lobes are connate and included; the stamens oblong and thick; the corolla coriaceous, obvoluta triquetrous, crowned by the calyx, 3-celled, and 3-seeded. The species are permanent herbs, rarely suffrutescent.

TRIOXANTEM. (Fever-wort, a erect hairy fimbriate round stem from one to four feet high. The leaves opposite, the pairs crossing each other, ovate, lanceolate, acuminate, entire, rather flat, abruptly narrowed into the petiole; the flowers of several kinds, white, or yellow, or red, the filaments oblong, the anthers oblong, as are the ovary, the ovules numerous. In America, in the United States, on real rocky grounds, particularly in limestone soil.

The species of Tricranium will grow in almost any kind of soil, although they prefer a vegetable or peat mould, and they are easily propagated by dividing at the root or by seeds, which generally ripen in abundance.


TRISETUM, a genus of grasses belonging to the tribe Aveninae. It has crowded spikelets. Glumes from 2 to 6 flowered. The outer palea with falcate lateral nerves, ending in acute teeth, armed. The anthers, dorsal, keeled, and twisted. The ovary red. The glumes acute and long-haired. The flowers yellowish. The upper glume oblong, lanceolate, acuminate. The floral axis hairy. It is found in fields in Great Britain. (Babington, Manual.)

TRICHODORIS, a group of fossil Crinoidae (Portlock), from the Silurian strata of Tyrone.

TRICHOSANS are in Scotland, on the northern declivities of Ben Venn, on the southern outskirts of Loch Katrine. They constitute a landscape of a very peculiar kind; for about two miles in length the surface of the ground presents the greatest imaginable irregularity, consisting of a succession of ravines, depressions, and hillocks of trifoliate, and dense and unsheltered, ranging between 200 and 400 feet. The whole is overgrown with bushes or trees, and constitutes the most complete maze which can be conceived. The paths which traverse this tract turn and twist at every step, and present a different aspect to the traveler. The individual who first enters the district is wholly lost. The veller finds himself almost at every minute in a country which has totally changed its aspect, and presents quite different objects from those which met his eyes a few moments before. It has 3 coloured flowers, and this is the only species of this tract, favoured, in the last century, the illicit distillery of whiskey; but it is stated that, at present, this trade has entirely ceased.

TROUGHTON, EDWARD, the first astronomical instrument maker of our day, was born October 1753, and died at his house in Fleet Street, June 12, 1835. He came of a family of respectable yeomen, and was placed in the firm of his uncle and brother, who were carried on business as mathematical instrument makers. In 1782 the Troughtons established themselves in Fleet Street; in 1826 Edward Troughton, then the sole survivor, took Mr. Mathias into partnership. There is a full memoir of Troughton in the monthly notices of the 'Astronomical Society,' vol. iii. p. 149. A handsome subscription bust, by Chantrey, is in the Observatory at Greenwich, and the latter being the last of the genus, when he was nearly deaf, only hearing by the help of a powerful trumpet; and he never could distinguish colours otherwise than by their brightness,—a ripe cherry and its leaf were to him of the same nature. The larger astronomical instruments are not the facsimiles of one another, which the smaller and more universal ones are: any more than the great architectural displays of a large city are of the same kind, in such a place as Paris, distant to one and the same degree, the houses of one of the same street. Each one has its own difficulties, its own objects, and its own way of overcoming the
first to meet the second. The great works of Troughton are as well known in the astronomical world as those of Wren in the physical; and he also gave himself to all the minor branches of his business, and of his it may be said with truth that he improved and extended every instrument he touched, and that every astronomical instrument in its turn the subject of his attention. 'The instruments which facilitate navigation were peculiarly objects of interest to Mr. Troughton: and long after his infirmities were an effectual bar to the application of his most esteemed friends, he exerted himself to supply the seamen with well-adjusted and accurate sextants.' The articles on astronomical instruments in this work contain frequent references to Troughton's improvements. He wrote one or two articles in the 'Philosophical Transactions' and several in Brewster's 'Cyclopaedia,' references to which will be found in the memoir cited.

TROUS DE LOUP, in the military art, are pits dug in the ground in the form of inverted cones or pyramids, in order to serve as obstacles to the advance of an enemy: each is made about 8 feet in diameter, or in breadth, and as many in depth, and a pointed stake is planted upright in the bottom. The pits should be disposed chequerwise in two or three rows, their centres being at distances of about 10 feet from one another; and their sides should have such a slope that the enemy's riflemen, should they attempt to occupy them, must be concealed in them from the view of the troops whose pits they protect.

The earth obtained from the excavations should be formed into a sort of glaciés within the line of pits in order that the enemy may not use it to fill them. The Trous de loup are generally formed before the salient points of field-works or in the intervals between them; and they are sometimes executed in rear of such works in order to protect the gorges when the latter are without parapets.

TRYPHONINUS, CLAUDIUS, a Roman jurist who lived under Septimius Severus and his son Antoninus Caracalla. He wrote notes on the works of Cervidius Secundus, and to this last known book of Disputations, from which there are excerpts in the Digest. There is a rescript of Antoninus to him (Cod. 1, tit. 9, s. 1), but whether in his capacity of governor of Syria or as the agent of the Fiscus is uncertain. He is cited once by Paulus.

TUNNY. [ThYNNUS, P. C. S.]

TYLOPHORA (from τρύγος, a swelling, and the root φορά, to bear, in reference to the ventricose pollen masses), a genus of plants belonging to the natural order Asclepiadeae. It has a rotative 5-parted corolla, the corona 5-leaved, the levula simple and flabby. The style is terminal, on a membrane; the pollen masses erect, fixed by the base, with simple margins, transverse or ascending, minute and ventricose. The follicles smooth, tapering to the point, compressed, and somewhat angular on one side. The species are twining herbs or subshrubs. The leaves opposite, membranaceous, and flat. The flowers usually small.

TYPHA, a genus of plants belonging to the natural order Aridieae and the suborder Lemnese. The sterile and fertile spikes are cylindrical. The sterile is surrounded with setae. The three anthers on one filament; the ovary surrounded with setae, at length stalked.

TULIFLORA, great Reed-mace, has a stem from six to seven feet high; linear leaves, nearly sessile, the sterile and fertile cactins contiguous and very long. The leaves very broad and overlapping the inflorescence. It is found in ponds and lakes in Great Britain. (Babington, Manual.)

TYPHUS, a form of fever, in which low nervous symptoms predominate. The following are its principal features:

- It has a slow and insidious origin, lasting from fourteen to twenty-eight days. It is attended during the principal part of its course with symptoms of depression and exhausted nervous power, with feeble pulse, great muscular weakness, and low delirium.
- There is a dry, rough, dark tongue, black sores on the teeth and gums, and general fustor of the body. It is capable of being propagated by the contagious emanations from the person affected. This is the low nervous or typhoid fever of this country. For an account of fever and its distinctions, see Fever, P. C.; Strobes, P. C. S.

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VOLUME II.
UDAL TENURE. [Sheetsands, P. C., p. 385.]

UDOTEA. A species small from Bridlington is referred to this genus by Mr. J. E. Lee.

ULÖNDRON, one generic division of the great group of Lepidodendron families of plants which occur in the coal formations.

UNDULATORY THEORY OF LIGHT. This subject has been already treated briefly, under the same designation; and for further notices concerning its principles, as well as for its applications explanatory of the remarkable phenomena of light, the reader is referred to Dissection, and to Polarization of Light (P.C.), also to the following articles, which have been introduced in this Supplement: Circular Polarization; Colours of Flames; Elliptical Polarization; Polarization, Movements; Polarized Rays; Swiftest Propagation, Principle of; and Vibrations of Light.

UNION OF ESTATES. [Merer, P. C.]

UNITED STATES OF NORTH AMERICA. Since the article Oregon Question, P. C. S., was written the dispute concerning the Oregon territory has been settled. On the 28th of June, 1846, Sir Robert Peel, in the speech in which he announced his resignation of office, informed the House of Commons that the British government had offered a convention to the government of the United States, of which the President of the United States, on the 13th of June, 1846, announced the acceptance by the American government, without the addition or alteration of a single word. The first proposal of the British government was as follows:

'That from the point in the 49th parallel of N. lat. in which the boundary laid down by existing treaties between Great Britain and the United States terminates, the line of boundary between the territories of the two countries shall be continued westward along the 49th parallel to the middle of the channel which separates the continent from Vancouver's Island, and thence southerly through the middle of the said channel and the Fraca Straits to the Pacific Ocean. Provided the navigation of the channel and straits, south of the 49th parallel, shall be free and open to both parties.'

This leaves to the British the whole of Vancouver's Island, with equal rights of navigation in the Straits. The second proposal was:

'That from the point at which the 49th parallel of N. lat. intersects the great northern branch of the Columbia river, the navigation of the said branch shall be free and open to the Hudson's Bay Company, and for all British subjects trading with the same, to the point where the said branch meets the main stream of the Columbia, and thence down the said main stream to the ocean, with free access into and through the said river or rivers; all the usual portages along the line thus described to be free and open to both parties. Provided that in navigating the said river British subjects shall be on the same footing as those of the United States: it being always understood however, that nothing herein shall be considered as preventing the government of the United States from making any regulations as to navigation of the river not inconsistent with the present convention.'

The circumstances under which Texas has been annexed to the Union are stated under Texas, P. C. S.

Michigan, described as a territory in P.C., was admitted into the Union as a State at the end of 1835. The Governor is elected for two years, and his salary is fixed at present at $1,500 dollars per annum. The Senate consists of 18 members, elected for two years; the House of Representatives of 63 members, elected annually. The pay of the members is three dollars a day during the session. The seat of government is at Detroit, or wherever the legislature shall direct, till 1847, when it is to be established permanently. The legal establishments are, a Court of Chancery, a Supreme Court, Circuit Courts, and a District Criminal Court. The Chancellor has a salary of $1500 dollars, and there are five Chancery Circuits. In the Supreme Court there is a Chief Justice, with a salary of $1600 dollars, and three associate Justices with salaries of $1500 dollars each. The four Judges of this court are appointed by the Governor, with the advice and consent of the Senate, for a term of seven years. In 1845 the main institution of the State has 78,000 students, and 12 preparatory schools, at Tecumseh, Rome, Kalamazoo, White Pine, and Ann Arbor, about 1200 students. The professors were:—Greeley and Roman Language; 2, Mathematics; 3, Moral and Mental Philosophy; 4, Geology and Mineralogy; 5, Botany and Geology. In 1844 the number of scholars in the Common Schools was 66,818, and the amount appropriated from the state treasury among the several districts was $28,063 dollars. Michigan is thought, both as to the means of education and the success of the system pursued, to be little behind the most forward of the eastern States. The State prison at Jackson is constructed on the Auburn plan. The Central Railroad runs from Detroit to Marshall, 110 miles, and 36 miles more of the road were expected to be completed by the end of 1846. The Southern Railroad runs from Monroe to Hillsdale, 68 miles. The population of Michigan in 1830 was 31,639; in 1840 it was 212,267. There are no slaves. Florida was admitted into the Union as a State in 1845, the first Governor having entered upon his office in October of that year. The Governor is elected for four years, the Senators for two years, the Representatives for one year. The number of Representatives is never to exceed 60. The Judges of the Supreme Court are to be elected by a concurrent vote of both Houses, at first for five years, and after that according to good behaviour. The right of voting is to belong to every free white male, aged 21 or upwards, who has resided in Florida two years, and six months in the county in which he votes, and who shall be enrolled in the militia or by law exempt from serving therein. No laws are to be passed to encourage immigration of persons bringing slaves with them. The General Assembly may prevent free colored persons from entering the State. The population in 1830 was 54,730; in 1840 it was 54,477, of whom 28,717 were slaves. (American Almanac, 1837, 1845, 1846.)

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V.

VACHHELLA, a genus of plants belonging to the natural order Leguminosae, contains the only 5-toothed; the corolla tubular, genopetalous, and 5-toothed. The stamens are numerous and distinct; the legume cylindrical and turpiz, scarcely dehiscing, filled with pulp, and a dark brown, and set with 

V. Fertznitiana is a native of the East and West Indies and Africa. It is a large shrub or small tree, with straight sharp thorns. The leaves are bipinnate, the leaflets linear and nearly glabrous; the peduncles and pedicles more or less hairy; the flowers capital, the heads globular, 2 or 3 together, each on an axillary peduncle. The bark exudes a considerable quantity of gum. The flowers when distilled yield a delicious perfume.

(Lindley. Flora Medica.)

VAILLANT, WALLENT, a very distinguished portrait painter, was born at Lille in 1625, and was the pupil of Franscisco Queslinus, at Antwerp. He painted the portrait of the Emperor Leopold I. at Frankfort, and many of the people of his court. He subsequently went with Marshal Grammont to Paris, where he was equally esteemed by the French court. After having amassed considerable riches he died at Amsterdam, in 1677. Vaillant was employed in 1685 at Brussels by Prince Rupert to paint the portraits of some persons in the new mode of mosaic into engraving then communicated to the Prince by Siegen. (Siegen, Leopold van den, P. C.S.) As Vaillant is the first artist who engraved in this style, his prints have more than ordinary interest. Among these are two portraits of Prince Rupert, one of which is inscribed—Prima Roberi, vinder van de Swarte Prent Konst, which is one of the principal causes of Siegen's being so long deprived of the merit of his invention.

Vaillant had four younger brothers, who were all painters or engravers and his pupils.

(Deseupe, Vues des Peintres Flamands, etc.; De Laboisse, Histoire de la Gravure en Monique Noire.)

VALENS, ABURNUS, a Roman jurist, whose age is partly determined by the fact that he cites Jovannus and Julius (Dig. 4, tit. 4, s. 33), from which we may conclude that he was younger than both. He is called Aburinus in the Florentine Pandect. He was a Sabian, as appears by his being placed by Pomponius among the followers of Jovannus. It appears that he was living under Antoninus Pius (Capitol., Pac. 193). The same is also the case of Capistrani, stands, he is called Salvis Valens. His complete name may have been Salvis Aburinus Valens; or Salvis in this passage may be separated from Valens and may mean Salvis Julianus. But there is a rescript of Flavius (Dig. 48, tit. 2, s. 7, 8) addressed to Salvis Valens.

Valens wrote seven books on Fideicommisina, from which there are excerpts in the Digest; and there is also in the Digest a passage from the seventh book of a work on Actions. Valens is mentioned by Pomponius, and cited several times by Paulus (Dig. 4, tit. 4, s. 33). VALESSOR. [VAYASOR, P.C.]

VAN, or VAN. [VANERSS, P.C., p. 360.]

VAN HOECK, JAN, a distinguished Flemish painter, was born at Antwerp about 1600. He first studied for one of the learned professions, but became the pupil of Rubens, and studied upwards of some time in Rome. While in Italy he was invited by the Emperor Ferdinand II. to his court, and was much employed by him. He eventually returned to his own country, where he died, according to Houbraken, in 1650.

Van Hoeck was admirable in history and portrait, and excelled both in light and shade and colour; his figures are also beautiful, but is than is the case with those of the pupils of Rubens and the Flemish school generally. The Christ on the Cross in the church of Saint-Sauveur, or the cathedral, at Bruges, is one of the finest pictures in Belgium. The Christ, which is one of the size of life, has extraordinary effect and reality, and is certainly superior to the celebrated Christ of the church of St. Michael, at Ghent, by Vandyck, and it is more real and impressive than any of those of Rubens: beneath the cross are the Virgin and other saints. There is a print of it by the younger Cornelius Galles: this engraver however is not very accurate in his drawing. Independent of the Christ, the composition of the picture is meagre and formal, and wants dramatic truth.

VARIATION OF PARAMETERS. A parameter was a name originally given to a particular line, plane, or cone section: being the third proportional to a diameter and its conjugate. In time the word was applied to any line which serves by its value to distinguish, or to help to distinguish, one individual of a family of curves from another: thus the radius of a circle, the axes of an ellipse, the co-ordinates of the centre of either, were called parameters. When a word gets into the descriptive name of a method, it may happen, as part of a phrase, to outlive its own separate use: and such has been the case with the word parameter. As this word is now generally abandoned, and element is the most frequent substitute for it, it would be desirable to speak of variation of elements.

Whatever phrase we may use, the thing occurs both in physics and mathematics, in modes which are closely connected with each other. A planet moves in a curve which is not an ellipse, but which should change and become an ellipse if the disturbing attractions of the other planets were removed, and that of the sun only continued. The easiest way of calculating the planet's motion is to consider the planet as moving in this ellipse, while during the motion the elements which determine the ellipse are perpetually changing: so that the form and position of the ellipse both vary. This is done in such manner that the ellipse of each moment is that which the planet would go on to move in, if at that moment the disturbing attractions were all removed. The advantage is that in this case the elements will vary very slowly, or it will be long before the disturbing attractions produce much effect. In theory, any curve might be taken. A planet for instance might be supposed to move in a parabola, which varies its dimensions and position in a manner to be determined.

In TROCHOIDAL CURVES, P. C., all the curves given are produced by a point moving in a circle with variable elements; that is, of variable centre, though given radius. If it were required to investigate trochoidal curves with loops and undulations of different magnitudes, the best way would be to consider them as made in the same manner, with a circle of variable radius also: or else to make both circles variable.

In the differential calculus the variation of elements is introduced thus: — an algebraical expression containing some variables and some constant elements be proper to answer a certain purpose, it is not impossible that it may answer the same purpose when the constants are made variable, provided they are made to vary in a proper manner. Now, if the purpose which is to be answered involve differentiation, the infinity of the number of suppositions which may be made as to the variation of the (former) constants is equivalent to introducing an arbitrary function instead of each constant, to be determined by the conditions of the question. Two species of cases have frequently arisen.

1. When under certain circumstances a problem is solved by an expression containing certain constants, and the circumstances are then altered; it is often convenient to inquire whether the altered problem might not be solved by the same expression, on the supposition that the constants become variable. And the question then is, how the (former) constants are to be made to vary.

2. Without any alteration of the circumstances, having a solution which contains constants, it may be asked how to make arbitrary variables in place of constants, so that the altered expression may still be a solution.

In both cases it is obvious that as soon as the constants are made variable there is introduced some effect of all expressions into which they enter will receive an accession of terms above what they had before. These new terms, which we may describe as functions of the variations of the elements, must, in the first case at least, be taken as to provide for the effect of the altered circumstances. But in the second case they must destroy one another's effects altogether. We shall take a few instances in which the variation of elements is successful or unsuccessful.

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1. The equation \( y^2 + Py = 0 \), P being a function of \( x \), is solved by
\[
y = \sqrt{\frac{C}{P}} + \frac{P}{2} \] 
C being a constant. Now alter the equation into \( y^2 + Py = Q \), and to meet the alteration, let \( C \) be a function of \( x \). On this supposition \( y^2 + Py \) becomes
\[
-CP^2 \sqrt{\frac{C}{P}} + C \frac{P}{2} \sqrt{\frac{C}{P}} + Q \] 
But this ought to be \( Q \); therefore we must have
\[
C \sqrt{\frac{C}{P}} = \frac{Q}{C} \] 
and \( C \) being another constant. Here \( y^2 + Py = Q \) is solved by \( y^2 + Py = 0 \) and subsequent variation of an element.

Now try \( y^2 + Py = 0 \) and \( y^2 - Py = Q \) in the same manner. The first is solved by \( y = \pm (x + C) \) and if \( C \) be made variable, and \( y \) thus altered be introduced into the second, it is found, making \( x + C = C \), to require the solution of
\[
x^2 + Q \sqrt{Q} = 0
\]
as difficult an equation as the original. In this case we are unsuccessful.

2. Let \( \frac{du}{dy} = x \). One solution of this is \( u = \frac{1}{2}x^2 + \frac{a}{x} + \frac{b}{x} \).

The above solution is thus a function of \( a \) as constant and \( b \) as constant. To find a more general solution of this equation let \( b \) be a function of \( a \) as a function of \( x \) and \( y \).

We have then
\[
\frac{du}{dy} = \frac{dx}{dy} + \frac{dy}{dx} \] 
and the equation will obviously still be satisfied if \( a \) and \( b \) be so related that
\[
x + \frac{dy}{dx} = 0
\]
where \( a \) is what function of \( x \) we please, so also is \( db \).

It is followed that if \( y = \phi(x) \), and \( x = f(y) \), we may make \( a \) what function of \( x \) and \( y \) we please. Let \( a = \phi(x) \) and \( b = f(y) \).

We have then
\[
u = \frac{1}{2}x^2 + \phi(x).
\]

This subject has many developments. We have introduced it here under the idea that some students of the differential calculus may be led to consider it at an earlier period of their reading than would otherwise give it to them. It is to be remarked that this method does not merely search for some solutions of a question; if the number of constants be sufficient, it goes direct to the most general solution. Now in the first example, the function of \( x \) what is capable of being represented by \( C \sqrt{\frac{C}{P}} \); in our third there is no function of \( x \) and \( y \) so that the complete solution is
\[
u = \frac{1}{2}x^2 + \phi(x).
\]

Vegetable morphology, or Metamorphosis, is that department of science which contemplates the laws which regulate the forms of plants and of their particular parts. In the earlier period of the history of botany plants were studied as individuals or groups of individuals, without any reference to the general laws which governed either the external or the internal forms of plants, or those which influenced the production of various forms in the same individual at different periods of its existence, or of the same species under varying circumstances.

Linnæus, although he never made any practical application of his idea, seems to have been the first to have suspected that the varied forms of the flowering organs, and even other appendages of the axis of the plant, were modifications of the leaf. In his 'Philosophia Botanica' he has the following remarkable passage:—The origin of the flowers and the leaves is the same; the origin of the buds and the leaves is the same: the bud consists of the rudiments of the leaves; the flower comes from the rudiments of the leaves united. Although the doctrine of metamorphosis is a limited one; and was thus畅销ly proclaimed by the German Linneus, and many facts pointed out by him to prove its truth, yet little or no notice was taken of this department of science by his followers. The next great botanist, who drew attention to this subject, was not, and apparently quite independent of Linnæus, was not a botanist, but a poet. Goethe frequently occupied himself with natural history studies; and in one of his letters, dated 1768, mentions several of his friends who were botanists, among whom he distinctly stated that every part of the plant is the reproduction of a primitive type.

This was followed by a paper on the subject, in which he clearly points out the importance of this idea in the unfolding of a primitive type. At the time these papers were published they were read with the same as the fictions of a poet rather than the sober realities of science. In Great Britain they found little favour, but were quietly thought over by Robert Brown, who, by a series of accurate observations demonstrated the practice of this doctrine in the morphology of numerous species of the various families of plants. The idea of Goethe was also adopted by De Candolle, in his doctrine of a primitive type among plants, from which all departed by the decrease, increase, and subordination of their organs. In this way the idea that morphology has more or less influenced the greatest botanical observers of the present day, and it assumes a position as the first importance in botanical inquiries.

Morphology may be divided into two great divisions. First, that which treats of the forms of plants and their organs in general, and which is only concerned with a few of those general forms which are found common to all plants; and secondly, that which treats of the forms of particular groups of plants and of individual organs. This latter department is of the utmost importance, and is that which contributes so greatly to the just apprehension of the relations which exist between the various groups of plants and their organs. It may be divided into two parts, one of which regards the external form of the plant, as resulting from the combination of the various tissues into organs; the other regards the internal form which the various tissues of the plant assume.

There are certain general principles in morphology which have been well established, and one of these is, that the organs of plants in the Penny Cyclopaedia, and that every plant, has an ascending and descending axis; the former of which is called the stem (Exoecous, P. C.; Exoecous, P. C.), and is the latter the root (Rooy, P. C.). They may be traced downwards or upwards through the various series of plants; downwards till we arrive at a point where the cells exhibit a tendency to either an ascending or descending growth, as in the cells of Protococcus; or upwards till the increasing development of the stem exists in the most complicated variety of forms. It is in the latter or higher groups of plants that the laws of morphology have been studied with greatest attention, and have led to the belief that its only application existed in the series of changes which the leaf of the higher plants undergoes in its conversion into the parts of the flower and the fruit. It is from this department of botany that the most convincing illustrations of the truth of the laws of morphology may be drawn, and it is here that the most obvious practical applications of them may be made; but form does not more distinctly distinguish the higher than the lower plants, and in many of the phenomena of the latter morphology as a natural law may be applied as to the highest plants.

The leaf however affords the best illustration of the nature of morphological laws. This organ may be regarded as a theoretical type on which the other organs are formed, and from which they are
VENUS

supposed to have departed. In support of this theory we have the fact, that all the organs of the axis may be traced by insensible gradation either to or from the leaf. Thus the bract is often undistinguishable from the leaf, the sepals from the petals, the petals from the stamens and from the carpels, the carpels from the leaves, and the ovules from leaf-buds. This is the series of gradations which prove the positions of morphology. When these gradations take place, as they usually do from nature, the leaf in the internal organs of the flower, it is called an ascending metamorphosis; when it takes place from the central organs of the flower to the leaf, it is called a descending metamorphosis. This latter phenomenon has often presented many variations and such changes are called monsters. Most of the double flowers of our gardens are the result of a descending metamorphosis, in which petals are developed instead of stamens. As an instance of organs which have not assumed the development of leaves, but which yet are formed on the same type and obey the same laws, we may name the stigmas and scales of leaf-buds.

The result of these facts is that we may regard the flower as a collection of leaves arranged in whorls, and in fact a branch with a short axis. This idea explains at once those apparently anomalous occurrences where branches grow out of the fruit of the pomegranate, or the apple. The apple does not represent the growing point of a branch, which, if the circumstances no longer exist which produced the peculiar leaves from which it is formed, will take on the ordinary growth of a fruit. The apple with its sepals and its petals is the expression of certain laws which regulate the growth of the flowers and fruits of plants, and which, being applied to their peculiarities, are the best means of securing a natural classification.

VENUS. [From Venus, the Roman goddess of Love.]

VELLA. (Latinalised from Velo, the Celtic name of the crest,) a genus of plants belonging to the natural order Crucifereae. It has an ovate pouch, with a dilated winged leafy flat style, longer than the convex valve. The flowers are yellow, and are, as well as the pod, erect.

V. amara was found in the island of Ray on Salisbury plain, but has not since been noticed. It has double pinnatifid leaves, and is a native of Spain; it has yellow petals with long dark purple claws; the larger stamens are conic by pairs; the seeds two in each pod.

This shrub, though generally kept in a greenhouse, is sufficiently hardy to live during the winter in the border in a warm aspect. Young cuttings will strike root in sand under a glass.

(Don, Gardner's Dictionary; Babington, Manual of British Botany.)

VENUS INSPIECIENDA, WRIT DE. When a woman is suspected to have begotten herself with child in order to produce a supposititious heir to the estate, the heir presumptive may have a writ de ventre inspeciendo, to examine whether she be with child or not; and, if she be, to keep her under protection until it is safely brought to term, and to submit it to the practice of the civil law: but if the widow be, upon due examination, found not to be pregnant, the presumptive heir shall be admitted to the inheritance, though he hath to look to another, on whose behalf years have been spent from the death of a husband! (Blackstone, Comm. i. 456.) The Roman practice is explained in the Title of the Digest (25 tit. 47) as being necessary in cases of bastardy and infanticide. This title contains a Reciscript of Ausilius and a case in which a woman denied her pregnancy and the husband maintained it. The wife had separated from the husband, and the child was born in the same house, though by law it would belong to the husband. If a woman alleged that she was left pregnant by her deceased husband, it was her duty to announce the fact to those whom it concerned, and to inform them that they might, if they pleased, send women to inspect her (que ventrum inpectant). All the proceedings of inspection and of watching the woman, if she should be reported to be with child, are minutely described in the Praetor's Edict. The penalty in case of the woman not complying with the Edict was, that the Praetor would refuse to the child the bonorum possessionem.

The form of the English writ de Ventre Inspeciendo is given Co. Litt. 8 b. It is directed to the sheriff, and commands him to try the jury of twelve for the county whether the woman is with child, or whether she be ensnare. If they find that she is with child, another writ issues, which commands her to be safely kept and duly inspected by the women, who must be present at the delivery. Tracton is the writer by whom this work is first mentioned.

The use of this writ is an instance in which what is called a proceeding at common law is taken from the Roman system. The writ is not obsolete, as some people suppose; it has issued within the last few years. (Co. Litt. 8 b. and N. 44 in Butler's edition; Comyns, Digest, Bastard, C.)

VERMELIUS. [From Vermilion, P. C. S.]

VERMIGLI, PIETRO MARTIRE, born in Florence in 1500, studied for the church, and entered early the Order of the Regular Canons of St. Augustine; in which he became distinguished for his learning, and rose to offices of trust. Being at Naples he became acquainted with John Valdes, a Spaniard, who had been a convert to the doctrines of the Reformation. Vermigil adopted some of those tenets, but still returned to his Order. The Erastians of Wittenberg sent him to the University of Louca, as prior of San Frediano, he there publicly avowed his new doctrine, and was soon after compelled to fly to Switzerland, in 1542. He thence went to Strasburg, where he became the Convertor. The Duke of Wurtemberg, on the invitation of Bishop Cranmer, he repaired to England, where he was graciously received by King Edward VI. and was appointed Lecturer upon the Holy Scriptures at Oxford, where he met with much opposition, from the heads of colleges and the higher graduates, and ran some personal risk. In 1553, after the accession of Queen Mary, being obliged to leave England, he returned to Strasburg, where he resumed his chair as Professor of Divinity, and became an Aristotelian philosopher. In 1566 he was invited by the senate of Zurich to fill the chair of theology in that University, which he accepted. In 1561 he repaired, with other Protestant divines, to the conference of Passy, in France. In the following year Vermigli died at Zurich, much regretted. He wrote on dogmatic and ethical subjects, commentaries on parts of the Scripture, besides numerous epistles to 'His Brethren of the Protestant church of Louca,' to the Protestant churches in Poland, to the English church, to Calvin, Bullinger, Beza, Melanchthon, and other reformers, to Queen Elizabeth, and to several English prelates and noblemen. His works were translated from the Latin into English. The Common Places of the most famous and renowned Divine Doctor Peter Martyr, divided into four principal parts by Anthony Marten, translated and published in 1645, under a biography of Vermigli by Josias Simler, of Zurich: this collection contains a complete course of Christian ethics, and may be read with advantage now.

VERNET, ANTOINE CHARLES HORACE, commonly called Carle Vernet, a French historical, genre, and battle painter, was born at Bordeaux, August 14, 1758, and was the pupil of his father, Claude Joseph Vernet, the celebrated marine and landscape painter. He entered the French Academy at Paris, where he gained the second prize for painting when in his eighteenth year, and in 1782, six years afterwards, he obtained the grand prize. With it the privilege of studying for a certain period in the French academy at Rome. In 1787 he was elected a member of the French Royal Academy of Painting and Sculpture. He was a pupil of Paul Aemilius, and he was subsequently, after the remodeling of the academy, nominated a member of the Institute of France.

His principal works are—the large picture of the Battle of Marengo, and a battle against the Mamelukes, exhibited in 1804; the Morning of the Battle of Austerlitz, with the Emperor giving orders to his Marshals, and an equestrian portrait of Napoleon, in 1808; the Bombardment of Madrid,
In common or white light, the vibrations of the refrangible molecules may be conceived to take place in any manner, but in the case of red light, French observers have observed that they are affected by the transverse vibrations only, or those which take place in planes perpendicular to the direction of the motion of the wave or ray, the vibrations in this direction, if they exist, are of very small magnitude. The hypothesis is supported by experiments made on a pencil of light which, after diverging from a radiant point, is reflected from two mirrors inclined to one another at a very obtuse angle, and transmitted through the air, if the two mirrors are having a great refracting angle, so as to proceed as if it formed two pencils diverging from different points; the reflected or refracted waves are found to interfere with one another so that the least possible number of maxima or minima are produced bright; but when two plates of tourmaline having their axes at right angles to one another, which consequently polarize the light in planes at right angles to one another, are placed in the directions of the waves reflected from the two mirrors or transmitted through two faces of the prism, the waves cease to interfere with one another and no dark fringes are seen. It follows that no vibrations could have then taken place in the directions of the motions of the waves of the incident light which had interferences ought to have been observed in the light which was polarized as well as in that which was not so.

For the consideration of the vibrations of light, in two polars or by which circular and elliptical polarizations are produced, see Circulaire Polarisation, P. C. S.

VICTOR, CLAUDE FERRIN, Duke of Belluno and Marshal of France, Commander-in-Chief of thearmy of the Voges, on the 7th of December. 1764. He was seventeen years of age when, on the 16th of December, 1781, he enlisted as a private soldier in the 4th regiment of artillery, and it was at that time that he distinguished himself in the charge when the first events of the Revolution of 1789 occurred, but, animed with the warlike spirit which then pervaded the French nation, he again eagerily sought for military employment, and entered as a volunteer the third battalion of the Department of the Drôme. A few months suffred for this young and intrepid soldier to raise himself from the lowest rank to that of adjutant-major and chefe de batallion. With the batallion under his command he distinguished himself at Corons, by pulling the attack of three thousand Piedmontese and a regiment of emigrants. At the head of the same batallion he obtained considerable success, in 1798, at the siege of Tou- lon; under the orders of General Lapoye, he gained the important heights of Pharon, and afterwards, with similar good fortune, attacked the Fort Aiguielle, the capture of which greatly contributed to the favourable issue of the siege. These brilliant actions, in which he was twice wounded, were rewarded by his promotion to the rank of adjutant-general.

Transferred to the army of the Eastern Pyrenees, with the rank of general of brigade, he rendered himself conspicuous in his actions at the siege of Cerdans (October 20, 1794) and Romans (January 2, 1795). After the termination of the war between France and Spain by the treaty of peace signed on June 12, 1795, he was sent with the army of Italy. The courage which he displayed in the several actions of that campaign, and particularly in the action at Bergio (May 30, 1796), brought him under the favourable notice of Bonaparte, who gave him every opportunity for further distinction by entrusting him with the management of manoeuvres as honourable as they were perilous. His conduct during the subsequent engagements which took place at Ceesa- nova and Mondovi (April 6 and 18, 1798) justified the high estimation in which he was held by his chief, and were recognised by the government at Paris in a flattering letter which they sent him. The following year, by a series of skilful manœuvres, he greatly contributed to the success obtained by Massena [Massena, Marshal, P. C. S.] over the Austrian general Wurmser [Wurmser, P. C. S.] at Corona (August 11, 1797). It was on account of his successses during this campaig, of which we have enumerated a very small portion, that he was raised to the rank of general of division. In this capacity he powerfully seconded the operations directed by General Lannes against the Papal States [Lannes, P. C. S.], and after delivering the Papal States by a series of skilful movements, he joined with the troops under his command the towns of Faenza and Cesena; he afterwards marched against Ancona with a detachment of twelve hundred men, and captured it without a shot being fired from the town. On the march, he collected twenty pieces of cannon, and a garrison of five thousand de-generate Romans. 'General Victor,' says Napoleon, 'crossed
the Po at Borge Forte, at the head of four thousand infantry and six hundred horse, and formed a junction, at Bologna, with the Italian division of four thousand men, under General Lathon. 'These and three thousand Portuguese came under the command of the States of the Church.' (Montbod賽, History of the Captivity of Napoleon at St. Helena, vol. ii. p. 58.)

After the battle of Custoza, General Victor was appointed to the difficult command of the troops of the Vendée. By his skillful dispositions, and by his conciliatory, but firm and decisive conduct, he maintained the tranquillity of that country. In May, 1816, going to the army of Italy, he was placed at the head of a division. In the following year, he acquired fresh renown at the engagement of St. Lucia (March 30, 1799). Shortly after this battle he received orders to advance against Artois. The campaign was decided in favor of the French army of Naples through the valley of the Borinonde; in effecting this movement, his division was attacked by a large body of Piedmontese insurgents, in the narrow and difficult passes of those mountains; his troops however bravely repelled this attack at the point of the bayonet, and, after surrounding great dangers, he was enabled to effect a junction with the army under the command of General Macdonald.

[VIC] [Macdonald, Marshal P. C. S.] Victor bore a distinguished part in the engagement on the banks of the Trebia, which proved disastrous to the French. He was afterwards sent to Paris by General Moreau, to solicit from the Directory returns for a considerable length of time. On the fall of the commission, he returned to Italy and resumed the command of his division, which acquired fresh laurels at the battle of Bassano, where it formed part of the centre under the command of Gen. Oudinot.

At the memorable battle of Marengo, the division of Victor formed part of the advanced guard; to the bravery and perseverance which he displayed on this occasion may in a great measure be ascribed the favourable issue of this long-disputed engagement. His services were rewarded by the presentation of a sabre of honour, on which was inscribed a flattering testimonial to his merit. He was afterwards transferred to the Bavarian army, and seconded to General Marmont; his conduct in that campaign, though unmarked by any brilliant exploit, was such as to maintain the high reputation he had acquired.

After the peace of Amiens, he was sent to the court of Denmark as ambassador from the First Consul. He held this office till 1806, when, on the breaking out of the war with Prussia, he was appointed to the command of the tenth corps of the grand army. A wound, which he received at the battle of Jena, did not prevent him from directing in person the operations of the corps under his command during this short but brilliant campaign; and he powerfully contributed to the victory obtained over the combined forces of the Prussians and Russians at Pultusk (December 26, 1806). In this campaign he was taken prisoner by a body of partisans, but, by a clever stratagem, succeeded in eluding his captors.

The following year was marked by the great battle of Friedland (June 14), in which Victor, at the head of the first corps of the grand army, so greatly distinguished himself, that Napoleon, on the field of battle, raised him to the dignity of Marshal of the empire.

After the treaty of Tilsit (July 6, 1807), Marshal Victor was appointed Governor of Berlin, a government including the greater part of Prussia. This office, which he held for fifteen months, was one which afforded many temptations to an abuse of power, but he appears to have excised his authority with dignity and moderation.

In 1813 he was intrusted by Napoleon with the command of the first corps of the French army in Spain. Shortly after his arrival in that country, he obtained important advantages over the Spaniards in the engagements of Epenosa (November 10 and 11, 1813), and Sobrarbe (December 4). On the 13th of January, 1809, he routed the remnants of the Spanish army which had been defeated at Toulouse [Lannes, P. C. S.], but, which, reinforced by French and Spanish troops, had advanced towards Madrid. The intrepidity, which had taken up a menacing position at Ucles. In this engagement upwards of three hundred officers, including two generals and twelve thousand soldiers, were made prisoners; all the baggage and ammunitions, with the treasures of the monastery of Escorial, were carried off by the French. According to the Spanish accounts, this victory was stained by the exercise of wanton cruelty towards the prisoners, in retaliation for similar cruelty exercised on the French, and the looting and plundering which was committed in Spain for the benefit of the French. (Duyfker, 'History of the Peninsular War,' vol. ii. p. 16.)
When the success of the allies and the abidement of Napoleon had replaced the Bourbon dynasty on the throne, he was rewarded by his appointment to the command of the second military division. On the return of Napoleon from Elba, he issued a proclamation, in which he allowed himself to speak of the cause of his fortune in terms which reflected discredit upon his character; he describes him as 'the man who has tyrannized, desolated, and betrayed France during twelve years,' and he urges every Frenchman to pursue to the uttermost his tyrant, but 'the satellites who accompanied him on his plundering excursion.' Independently of the ingratitude which this language betrays, it evinces a singular want of discernment, coming from one who had observed the most complete instance of these sentiments. In the years that followed, he appears in the examples of Marshal Berthier (Berthier, P. C.) and Marmont assisting Louis XVIII to Ghent. [Louis XVIII, P. C.] On the second restoration, he was created a peer of France, and appointed one of the four major-generals of the royal guard. He was also, not very unfortunately as conspicuous as the president of the commission charged to inquire into the conduct of the former brethren in arms during the hundred days [Nap, Marshal, P. C. S.]; in that capacity he is reported to have displayed an unnecessary and pertinacious severity. In 1816, Marshal Victor was appointed to the command of the reserve division of France. In 1812, he was named by Louis XVIII, minister of the war department; in this capacity he altogether disappointed the expectations to which his past had given rise; he neglected the affairs of the new army as effectually as he had done those of the old, and lost the little popularity he had hitherto enjoyed. He actively promoted the expedition to Spain of 1823 [St Clair, P. C. S.], and, having returned from the mission, he accompanied the army as second in command to the Duke of Angoulême. After the revolution of 1830, [Charles X., P. C. S.] he ceased to take any active part in public affairs; though he gave his adhesion to the government of Louis-Philippe, he attached himself to the legitimist party, and appears on one occasion to have been seriously compromised, with several of the leading men of that party, in exposing the cause of the Bourbon claimant to the throne of France. He died on the 3rd of March, 1841.

The position occupied by Marshal Victor among the generals of Napoleon is not a very high one. Though his services to the Imperial cause were numerous and many of his exploits were brilliant, he is rather distinguished as a brave soldier than as a skilful commander. At the head of a division he executed with boldness and precision the movements indicated to him by his chief, but he was devoid of the military genius requisite to originate a skilful plan of battle. Hence, in a separate command, as in many instances in the Peninsular War, he was generally unsuccessful. He does not appear, however, to have had any remarkable remark concerning him by Napoleon, which O'Meara records: 'Victrix est une bête sans talons et sans tête.' ('Napoleon in Exile,' vol. i, p. 511.) Such a judgment probably speaks rather of the limits under which Victor's conduct, on his return from Elba, had excited. It is indeed scarcely possible that it was the real estimate he had formed of this general's military character, since he had raised him from the position of a private soldier to the highest dignities of his empire, dignities which were in every case the reward of some species of merit, and not the mere fancy of favouritism.

(Biographie Universelle des Contemporains, Supplément, Paris, 1836; Biographie Moderne, Paris, 1815; Dictionnaire Historique des Batailles; Timot, Précis des Guerres de la Révolution; Dictionnaire des Girondins; see a notice of this work at the end of art. MAUR, P. C. S.; Norvins, Histoire de Napoléon; Labaume, Relation de la Campagne de Russie, Paris, 1814; Alison, History of Europe, vol. iii; Napier, History of the Peninsular War, vol. ii; Court and Camp of Bonaparte.)

VIE, JOSEPH MARIE, one of the most celebrated French painters of the eighteenth century, was born at Marseilles on the 18th of July, 1716, and was the pupil of various of the great painters, among them A. Rivalz, of Toulouse, and finally C. Natoire, at Paris, whither he removed in 1740. He was very sickly in his youth, and his parents thought that even the fatigues of his studies were too much for him. He soon recovered from the attack of strength could not bear, and endeavoured to lead him to pursue other pursuits; his own enthusiastic devotion to art, however, got the better of all obstacles, and in the year 1743, he competed successfully at Paris, for the grand prize of the French Academy, and was appointed to the pension of the Académie Royale de Peinture et Sculpture. The subject of the picture was the Plague of the Israelites, in the time of David. In 1744 he departed for Rome and remained there until 1750, when he returned to Paris. Besides many works, which are now dispersed among private, he painted his six years' residence in Rome, including several church or altar-pieces of great merit, as the Slaughter of the Innocents, St John the Baptist of Montpelier, and the only two portraits by Vivien of the two sons of the cardinal of Armande. The portrait of Mme Germain and Saint Vincent receiving the Crown of Glory from the hands of an Angel, and the Sleeping Hermits. These were followed by a long series of works at Paris, many of which were dispersed among the public at the sale of his estate in 1770, indicating a decided revival in the French school of painting from the insipid puerile state to which it had been reduced by Vanloo and Boucher. The pictures of Viey approach the style and technical excellence of the scholars of Correggio, though for some time his works were much maligned by the scholars of Boucher and Vanloo, and among them his own mosty Natoire. His St Denis preaching to the Gauls, one of his best works, was sold to a superior to the picture by F. Doyen of the Muses des Arlons, illustrating the tradition of the picture made by St Genevieve when ferreting out her pen of confessions from the cup of which she was caressed by lightning in the year 1219. Viey's picture was placed in the church of St Roch, where Doyen's is also now placed; they are nearly the same size, being about 24 feet high. St Paul at Tarsus is another important work: in the French revolution, Viey was justified by his contemporaries, who gave him the title of regenerator of painting in France: Count Caylus had always been an admirer of his pictures. Viey died in 1785, and was buried in the church of St Eustache, and of nature as represented in the works of the best Italian masters, and he succeeded to a considerable extent in both respects; but his admiration for the antique was carried to the utmost extreme by his pupil Vatea and David and their scholars.

Viey was elected a member of the French Academy in 1754, when he gave as his presentation piece a picture of Dido laying Attic wings. In 1775, after the painting of his picture of St. Denis, which was exhibited in the Louvre in the previous year, he was decorated with the order of St. Michel, and was appointed director of the French Academy at Rome, where he resided from that time until 1781, and was elected in the meanwhile member of the Academy of St. Luke. After his return to Paris he became one of the rectors and director of the Academy there (he had previously been professor); and he was finally appointed principal painter to the king in 1789. This post he of course lost at the revolution, but he was from its foundation a member of the Institute of France; he was also created by Napoleon a member of the Academy of Science, a title which he accepted, and proved useful. He died at Paris, March 27, 1809, having nearly completed his ninety-third year, and he was buried in the Pantheon. He painted until within a year of his death. According to his will, his works were to be divided among the heirs of two hundred; this number would not be great, if many of them were not of very large proportions. Few of them have however been engraved; the St. Denis, already mentioned, which is by some considered his master-piece, has been engraved only in outline by C. Normand for the 'Annales du Musée,' published by Landon, and in the 'Musée de Peinture,' etc. of Revuel and Duchesne. His works are from various subjects, but chiefly from the Sacred Scriptures, from ancient and modern history, and from Greek mythology. Among his more celebrated pictures are—Julius Caesar contemplated by the seat of Alexander at Cezar and regretting that he was still unknown at an Age when Alexander was already crowned with Glory; the Consecration of the Equestrian Statue of Louis XV; Marcus Aurelius causing Provisions to be distributed among the Poor; St. Louis presenting the Regency of the Kingdom in his Queen, Blanche of Navarre; St. Jerome; the Embarkation of St. Martha; Christ breaking Bread; the Resurrection of Lazarus; the Virgin attended by the Archangels by Night; the young pupil of various of the great painters, among them A. Rivalz, of Toulouse, and finally C. Natoire, at Paris, whither he removed in 1740. He was very sickly in his youth, and his parents thought that even the fatigues of his studies were too much for him. He soon recovered from the attack of strength could not bear, and endeavoured to lead him to pursue other pursuits; his own enthusiastic devotion to art, however, got the better of all
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V I L

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sioned to the council of the army; he has thus been enabled to give a minute detail of several events, of which we might otherwise have remained ignorant. His history has rendered the more valuable from the fact, that it is probably the oldest historical record in prose which the French language possesses. The first edition of it was published at Venice in 1612. There, in 1542; the most valuable is that by the learned Du Cange, whose notes, says Mils, 'are as valuable as his notes on the Alcaid.' [Britannica Historians, P. C.] The title of this edition of Du Cange, which is relatively to be the most trustworthy, is as follows: Histoire de l'Empire de Constantinople, divisions en deux parties, &c., érite par Geoffroy De Ville-Hardouin, avec la suite de cette Histoire jusqu'en 1640, tirée du manuscrit de Philippe Emmanuel de Gons]. Le tout est contenu dans 'Charles du Frene, Sieur du Cange; Paris, de l'imprimerie Royale, 1657, in fol.' In this edition the old text is accompanied with a modern French version. The history of Ville-Hardouin is also to be found in vol. xxviii. of the Recueil des Historiens des Gaules et de la France; Paris, 1822, in fol. The text in this edition has been revised on three manuscripts, and is to be printed with a glossary.


VINCENT DE PAUL, SAINT, was born on the 24th April, 1581, at Ranquines in the parish of Puy, near the Pyrenees, in the present department of the Landes. He was the third son of Louis de Paul, a small land-proprietor, and cultivator of a small farm in that parish. The narrow means of his family promised him a life of laborious toil, and till the age of twelve he assisted his parents in the care of their farm. He had however from early youth manifested so great an acuteness of intellect and sensibility of disposition, that they were induced to endeavour to give him a suitable education. He was placed as a student in a convent of the Cordeliers at Agen, the residence of the bishop of his diocese. At the age of sixteen, he was considered qualified to become tutor to the children of M. de Commet, an advocate of Agen, and the magistrate of his native village. This situation enabled him to study from the same time to relieve his parents from the expenses attendant on his education, and to prepare himself for the ministry of the church, to which he had now determined to devote himself. He assumed the tonsure on the 20th December, 1608, and the next year he went to Toulouse, in order to follow the course of theology of that university. But he was compelled, on account of the slender patrimony which was allowed him, to combine the duties of a teacher with those of a student. In the year 1609, after having received a previous order, he was made a priest by the Bishop of Perigueux; in the same year the order was made him of the parish of Tith, one of the most valuable in the diocese of Agen, which he chose in order to devote himself more entirely to the study of theology. In this study, notwithstanding the difficulties under which he laboured, he soon became eminent, and on the 12th October, 1604, obtained the degree of bachelor of arts, in philosophy and economics, and which precipitated his election to a benefice in the diocese of Agen.

In 1605, a legacy of fifteen hundred livres, which had been left him by a friend who had died at Marseille, compelled him to make a journey to that city. After taking possession of his legacy, he was returning by sea, when he was taken prisoner by some Tunisian corsairs, and was wounded in the conflict. He has left us a minute relation of his capture and imprisonment, in a letter written to his early patron, M. de Commet, on his return to France in 1607, of which there is a copious extract in the Biographie Universelle. During his captivity at Tunis and Algiers, he became the slave of three successive masters; the last of them, an Italian renegade, he converted to his former faith. After a delay of ten months, he was sufficiently fortunate to induce his master to forego the temporal advantages of a residence in a land where he had declared his principle of Christianity, and to escape with him to France, in which country they landed on 28th June, 1607. At Avignon, the penitent renegade was publicly redeemed to the privileges and consolations of the religious state. Shortly after his ordination as the vicar-general of the pope, Paul V., who had performed this ceremony, induced Vincent and his companion to accompany him to Rome. There he became acquainted with the ambassador of the Pope to the sultan, a nobleman who selected him as an important and confidential messenger to Henry IV. He arrived in Paris at the commencement of the year 1609, and obtained several interviews with the king. His time however he chiefly devoted to the service of the sick of l'Hôpital de la Charité, near which his father bought a house. The next year he devoted himself to the care of the poor sick, and the reputation of Vincent rose still higher in the estimation of those who had witnessed the patience and resignation which he displayed under the false accusation.

His residence in Paris was followed by a period of support of several influential personages, whose friendship and esteem his merit had conciliated. Among them was Marguerite la Valet, sister of Henry III., and the divorced queen of his successor, who appointed him her almoner, and Pierre de Berulle, afterwards cardinal, and founder of the congregation of the Oratorians. By the latter he was induced to accept the cure of the parish of Clechy in the neighborhood of Paris, where he discharged his duties with exemplary diligence. His short residence in that village was blessed with the happiest results; not only were the sick attended to, but also the poor were relieved, and the afflicted consoled, but family discord and dissent in religious matters were made by his pious influence to cease.

In 1613, he was obliged to abandon this peaceful scene of activity, and to take the road to Rome, as the son of Philip Emmanuel de Gondi, Count of Joigny, and general of the galleys of France. These pupils of Vincent were destined to occupy an important position in the history of their country; one of them became the well known Duc de Retz; another, the famous cardinal, who acted so conspicuously a part in the civil wars of the Fronde. [Retz, P. C.] In 1616, he accompanied the Countess de Joigny to her country residence at Soissons, where he officiated as the priest of the diocese of Amiens, where he commenced a series of missionary labours among the inhabitants, which were eminently successful. The memory of this mission he was in the habit every year, on the festival of the conversion of St. Paul, of celebrating with pious gratitude. The following year, he left the residence of the Count de Joigny to undertake the care of the parish of Châtillon, in Brasso, where his labours were attended with similar success. It was there that he became established and organized a religious association for the relief of the temporal and spiritual wants of the sick and poor, to which he gave the name of the 'confrérie de charité,' which became established in so many similar institutions in France and other countries. Towards the end of the same year, he was induced to return to the Count's family, and, with the permission and co-operation of the Countess, a lady of pious sentiments, no less zealous of the religious and moral welfare of those under his spiritual direction, he undertook several successful missions in the dioceses of Beauvais, Soissons, and Sens. An opportunity was now afforded to him to labour in a cause still more dear to his heart, which pressed on him with a more urgent danger, disappointment, and difficulty. He was in the habit of accompanying to Marseille the Count de Joigny, whose situation as commander of the royal galleys rendered it necessary for him frequently to visit that city. He was there moved with compassion on witnessing the sufferings and severities to which were subjected the unhappy criminals condemned to the galleys. To ameliorate their condition and to alleviate their sufferings, he entered the pious task which Vincent took upon himself. He found them in narrow and unhealthy dungeons, almost entirely deprived of air and light, with bread and water for their food, disfigured by filth, and covered with wounds, these wretched victims of their own misdeeds, and of the misguided policy of the state, sunk shortly after their admission into a brutal state of ignorance and ferocity. Vincent began by examining every individual among them as their friend and benefactor, and, undeterred by the rude scoffs and jests to which he was at first exposed, and undismayed by the harangues of a pestilential disease, which was at that time raging in the prison, he pursued his charitable mission: his kindly manner, his patient attention to their wants, his reproofs, tempered by mildness and Christian charity, and, above all, his own example of humility and submission, had a great effect on their minds. His labours were attended with so much success among them as to secure a ready acquiescence in his efforts for their welfare. In short time, the most unexpected
success attended the improvements which he introduced and the reformation which he effected. The ameliorated condition of these criminals was sensibly felt and gratefully acknowledged by his patron, who called the attention of the king, Louis XVI, to the success which had attended the humane measures for the reformation of criminals under his care and to the devoted nun by whom it had been produced, and the king, with appropriate consideration for the services he had rendered, appointed Vincent de Paul bishop of Beauvais, to which see he was translated, and communicated to him the direction of the first convent of the Order of the Visitation, which he had lately established. [SALES, DE FRANCIS, SAINT, P. C. S.]

In 1626, Vincent established the first house of the Daughters of Charity in the town of Macon, one for men and the other for women. He next visited the city of Bordeaux, for the purpose of inquiring into the condition of the criminals there confounded to the galleys. On leaving that city, he visited his friends and relations in his native village; having assembled together those who remained of his family, he informed them of his determination to die as he had lived, destitute of all worldly wealth; told them that money left by a priest to his family was đàod prospered, and thus weaned them from any expectation they might have formed of obtaining property at his death. This resolution however did not prevent him, on a subsequent occasion, from furnishing his children with funds required for the education of their own children. He was, as the first residence of the new company he had formed. For the better watching of his infant institution, he left the family of the Count de Joyeuse, and retired to that college. In 1627, he had no little influence with the Congregation of the Missions authorized by letters patent from the king, and in 1631, formally approved by a bull of the Pope Urban VIII. During this period he was actively employed in establishing retreats for the members of the society, and for persons destined to enter the orders of the church; a measure which greatly tended to the reformation of many existing abusés. In 1632, he yielded to the repeated requests of the Prior of St. Lazurface, Adrien Lebon, to accept his house and property for the purpose of furthering his projects for the instruction and relief of the poorer classes of the peasantry. Small as were the beginnings of this institution, he lived to see the orders of the Daughters of Charity, a religious society which has spread over a greater part of Europe. The institution however which has probably been most beneficent is that which he established in 1634; it was composed of a community of women, devoted to the care of the sick and especially devoted themselves to the attendance of the sick; a branch of this society, called 'Les Dames de la Croix,' was intended for the sole service of the Hôtel Dieu at Paris. To Vincent de Paul this city indeed has been peculiarly indebted for many valuable institutions, whose utility is recognised to this day. Among them may be mentioned the hospitals of 'La Pitié,' 'Bicêtre,' 'La Salpêtrière,' and 'Les Enfants Trouvés,' or Foundling Hospital. [PARIS, P. C. F. FOUNDLING HOPITAL, P. C. P. C.]

The origin of this last-mentioned institution exhibits a striking proof of the disinterested zeal of Vincent de Paul, devoted to the establishment of the Foundling Hospital in Paris. From the number of children, the fruits of licentious intercourse or the victims of their parents' poverty, were daily exposed in the streets and public places of that city, and often left to perish. The pitiable condition of these innocent sufferers excited the compassion and stimulated the charitable zeal of this devoted minister of the church. For the purpose of affording them food and succour he visited the hospitals, and laid before the king's hospital, over whom his simple piety had already exercised a beneficial influence. He called them together at the commencement of the year 1640, and so energetically set before them the motive of their creation, the necessity of their existence, the importance of the cause of these unhappyfoundlings, that they determined to subscribe for the trial of taking under their protection all who should hereafter be discovered. The generous gift of an annual rent of 12,000 livres from the Queen of Austria was the first assistance they received in their humane design. Soon however the wants of these foundlings exceeded the funds which charity could raise; discouraged in their efforts, and fearful that the task which they had undertaken was beyond their powers, and abjured the cause. The Daughters of Charity were about to abandon their charitable enterprise. To avert so unhappy an issue to his charitable project, in 1648, Vincent called together greater and more numerous assemblage. He summoned to his aid the rich and the humble, urged in support of his cause, and pleaded the interests of these innocent outcasts of society in a language of fervid imagination eloquent, an eloquence unaided by the arts of a polished education, but which, nevertheless, conveyed deep-seated sincerity and ardent zeal. The termination of his address on that occasion has been recorded by a high authority as one of the finest efforts of the language. [Maur, 'Essai sur l'Eloquence de la Charité.'] [MAUR, P. C. S.] Rich and plentiful were the fruits of his energetic pleading; alms were collected in abundance, two large buildings were converted into hospitals for foundlings, and the capital of France was no longer disgraced by the daily exhibition in its streets of helpless children dying from the want of food and succour. Besides the hospital already mentioned, Vincent founded two others, which have been productive of considerable benefit: one at Paris, which went under the designation of the name of Jesus, for the maintenance of forty poor men, whose age had incapacitated them for any useful occupation; the other at Saint-Benoît-sur-Loing, and furnished with the revenue of a small estate. Autumn, in Burgundy, for the relief of the poor and sick among the numerous pilgrims who are accustomed to visit the shrine of that martyr.

While occupied in the formation of societies and in the establishment of institutions of his fellow-creatures, he was no less zealous and persevering in attending to the immediate wants of the poor and destitute in the reach of his influence. He prevailed with the pontiffs during the latter period of the reign of Louis XIII., suffering under the threefold calamity of war, pestilence, and famine. To that province, by his charitable exertions, for several successive years, Vincent caused considerable quantities of money, which he collected in Paris, to be sent for the succour of its inhabitants. His biographers differ with respect to the amount, the highest stated being two million livres, and the lowest from five to six hundred thousand.

During the wars of the Fronde, the Queen-regent, Anne of Austria, instituted a council for the settlement of disputes on questions of theology, and appointed Vincent de Paul its president. In this capacity, he took a prominent part in the religious controversies of that period and warmly espoused the cause of the Jesuits against the followers of Jansenius. [JANSENISIUS, P. C. F.; PORT ROYAL, P. C. P.]

Through his influence, eighty people were confessed of the reformed Church, and to have employed against his adversaries only the legitimate weapons of argument and exposition. The four last years of his life were spent under the burden of infirmities, which compelled him to keep within the precincts of the convent of St. Lazarus, where nevertheless he continued efficiently to preside over the interests of the community he had established. His death, which occurred on the 27th September, 1660, was preceded by severe and protracted sufferings, which were borne with his accustomed patience and resignation. His remains were deposited in the church of St. Lazarus, in presence of the assembled clergy and the highest dignitaries of the capital, who for the honor of that of their spiritual father; but perhaps the tears of most genuine affection were shed on this tomb by the multitude of the poor and needy, who gratefully remembered that they had often been comforted by his kind regard, either in body or in charity.

The pugnacious of this eminent minister of the church has been written by two of its most distinguished prelates, Boisguille, Bishop of Decize, and the Cardinal Mauz, last of these has been greatly admired for the beauty of its style and the energy of its expressions; it may be seen in the majority of the French edition sub l'Eloquence de la Claire. [MAUR, P. C. S.] The canonization of Vincent de Paul was consecrated by a ceremony, known in the church of Rome by the name of Beatification, by Benedict XIII., on 14th August, 1729, and he was canonized as a saint on 16th June,
VINCENT, by Clement XII., who appointed 18th July as the day of this festival in the Roman calendar.

The name of St. Vincent de Paul stands deservedly high in the list of benefactors of mankind. His entire life was devoted to the advancement of the best interests of humanity; he labored unceasingly on the theme of his will to abolish suffering, poverty and crime, and his presence was always attended by consolation and relief to their victims. Men of all creeds and persuasions have rendered homage to his worth, and his name is inscribed on his own church, the misericords in which he sent abroad, the vast sums of money which he caused to be distributed to the poor and sick, his untiring activity in ministering to their wants, his disinterestedness and self-denial, his evangelical patience and religious resignation; above all, his genuine humility, which, while it shed lustre on those of his charitable deeds which are known, has caused a large proportion of them to be unknown and unwritten, save in the records of the book of life; these, it must be allowed by all, are the real miracles on which stands the fame of this apostolic man.

The following is a list of the writings he has left:—1. 'Regulæ secundum Constitutiones conventuum Congregationis Missionis,' Paris, 1668; 2. 'Lettre au Pape Alexandre VII., pour solliciter la Canonisation de François de Sales, procureur de la Congrégation de la Charité,' Paris, 1680; 3. 'Ceremonial pour l'Explication des Règles des Sœurs de la Charité,' Paris, 1826, in 8vo. The two most important biographies of St. Vincent de Paul are those written by the Mme. de Capetegue, Paris, 1827, in 8vo. ('Biographie Universelle,' tome xix., Paris, 1827: the article in this biography is written by Lelaurier, and is valuable from the research and impartiality which it displays; 'Vie de St. Vincent de Paul, Fondeur de la Congrégation of the Missions and of the Sisters of Charity, by Mme. Collet, Priest of the Mission,' Paris, 1848: this was written by a Catholic clergyman, Dublin, 1848; 'Les Pères des Martyrs, &c., from Allan Butler, tradition de Godescard, Versailles, 1819, tome vi.; 'Penny Magazine' for 1838, p. 4; Abelly, Evêque de Rodez, 'Vie de St. Vincent de Paul, Paris, 1839, 2 vols. 8vo., the most complete and valuable biography of St. Vincent.)

VINCULARIA. A species of fossil Zoonephyra is referred to this genus of Defracea by Portlock, from the carboniferous limestone of Ireland.

VIENNE, CHARLES, died June 5, 1756, at his house, Aldershott, Hampshire. When or where he was born has not been ascertained. He is known as the author of 'A General and Complete Abridgment of Law and Equity,' 24 vols. folio, 1741-1751, and as the founder of the Vinenian Professorship of Common Law in the University of Oxford. The 'Abridgment' is of two house and a half volumes, and is an Index, by a Gentleman of Lincoln's Inn. It appears to have occupied only ten years in printing, but Viner was probably occupied many years previously in preparing it. Blackstone says he was half a century about it. This stupendous work was reprinted in 24 vols. roy. 8vo., 1792-1794, and was followed by 6 supplemental volumes, roy. 8vo., 1799-1806, the compilers of which were James Edward Watson, Samuel Comyns, James Scegwicke, Henry Alexander John Wyatt, James Humphreys, Alexander Anstruther, and Michael Nolan.

Vins have resolved to devolve the bulk of his property, as his will states, 'to the benefit of posterity and the perpetual service of his country,' bequeathed by his will, dated December 29, 1755, about 12,000l. to the Chancellor, Master, and Scholars of the University of Oxford, to establish a Professorship, and to endow such Fellowships and Scholarships of Common Law in the university as the produce of his legacy might be thought capable of supporting. The Professor is to reside three months in the English language, and is not to take the degree of admission, and a course of lectures on the laws of England every year in full term. The course is to consist of at least twenty-four lectures, to be read in one and the same term, with at least three months between two terms. As relates to the reading of the lectures, Easter and Trinity Terms are reckoned as one Term. There are at present (1840) two Fellowships with 50l. a year each, and five Scholarships with 20l. a year each. Both Fellowships and Scholarships expire at the end of ten years after each election.

Blackstone was elected the first Vinenian Professor. He had commenced his lectures on English law in the year 1765, and in his two years before the close of his will, he had written the notes and commentary, as well as the preface, which are to be found in his translation of the Institutes of Gaius. It is remarkable that Blackstone's lectures gave Viner the hint for founding the Professorship. The succession of professors is as follows:—1765, William Blackstone, D.C.L.; 1790, Robert Richard, author of 'A Short Introduction to the Law of England,' 1 vol.; 1797, Richard Viner, D.C.L., author of 'A Short Introduction to the Law of England,' 3 vols. 12mo.; 1803, James Blackstone, D.C.L.; 1824, Philip Williams, B.C.L.; 1843, John Robert Kenyon, D.C.L. ('Chamber's Biographical Dictionary; Oxford University Calendar,' 1846.)

VIOLENT STRINGS. [GODFREY, P. C. S.] VISMIA (in honour of M. de Visme, a Lienon merchant), a genus of plants belonging to the natural order Hypericaceae. The calyx is five-parted, the petals 5, usually villous on the inside. The berry membranous, the styles 5, stigmas peltate. The stamens are numerous, disposed into 5 bundles, opposite the petals, alternating with 5 glands or scales. The authors are small, roundish, 2-celled, bursting lengthwise, the seeds with a double covering. The species are protected with a dusty, rarely with pellucid petals.

V. guianensis is a small tree with a stem about eight feet high, the leaves ovate, lanceolate acuminate, dilated at the base, many-celled, with follicular stipules. The stem is protected with a dusty, rarely with pellucid petals. The leafy yellow and corymbbose. The berry yellowish, ovate, soft, and somewhat 5-celled. A spot of the leaves is recommended in intermittent fever. This species is native of Guiana and Brazil. There are about twenty other species growing in the East Indies, Bengal, and Guiana: those from Guiana yield a resins gum, which is used in European medicine. This species is native of Guiana and Brazil. There are about twenty other species growing in the East Indies, Bengal, and Guiana: those from Guiana yield a resins gum, which is used in European medicine.

VITRIOL Description of the Vitriolus Britannicus. [GAUDY, JAMES, P. C. S.] VITTORINO DA FELTRE, born in 1379, at Feltre in North Italy, studied at Padua under the celebrated Guarino of Verona, and afterwards became professor of rhetoric and philosophy in the same university. Being some time after invited by G. F. Gonzaga, lord of Mantua, to superintend the education of his children, Vittrorino repaired to Mantua, where a separate and commodious residence was prepared for himself and his family. Vittrorino was a man of strong mind, of distinction repaired thither in succession to avail themselves of Vittrorino's instruction, and among them Federico di Monte-feltro, afterwards duke of Urbino, Giberto, prince of Correggio, Taddeo Bentivoglio, afterwards lord of Forano, Gino, Battista Pallavicino, afterwards bishop of Reggio, Lodovico Torrino and Bernardo Brenzoni, who became afterwards celebrated as jurists, Theodore Gazz and George of Treviso, Ambrogio Traversari, and Camaldulenses, who visited the school of Vittrorino at Mantua, gives his Epistles (lib. viii. viii.) an interesting account of his system of education; and Carlo Romini, who died latter, has written a work on the same subject, entitled 'Ideae et praecedentem et vice, a disciplina di Vittrorino da Feltre a de' suoi discepoli.'

It appears from the example of Vittrorino, of Guarino Veroncone, and others, that education, in the larger sense of the term, was better understood in Italy in the fourteenth century than it has been since, but it was confined to the upper classes. Gymnastics formed part of a Vittrorino's system. He lived with his pupils and took his meals with them. Their fare was wholesome, but plain. He had tablets of various colours to teach his younger pupils the rudiments of reading. His older pupils were instructed in rhetoric, mathematics, and ethics. He was not the first that taught to his pupils how to conduct themselves. He was not the first that watched the disposition and abilities of each pupil, in order to adapt him to that particular professional course for which he was best adapted. Temperate in his corrections, he allowed time and leisure for his pupils, and he never showed himself out of temper. He was beloved by his disciples, and he loved them like a father. Such was the character of this distinguished preceptor.
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y, P. C.

VOLPI, GIAN ANTONIO, born at Padua in 1686, studied in his native town, and became a good Latin and Greek scholar. In 1717 he and his brother Gaetano Volpi established a printing-press in their house for the purpose of bringing out correct editions of classic authors, and they engaged for their assistant the printer Giuseppe Comino. This press—known by the name of Volpi-Cominiana, produced among others a valuable edition of Catullus with copious notes. The edition was much commended by scholars, and the city of Verona struck a gold medal, which was presented to Volpi; the title is, ' Catullus Veronensis et in eum Jo. Antonii Volpii novus Commentarius,' 4to., Padua, 1737. Volpi afterwards edited Tibullus and Propertius. He translated from the Greek into Italian the dialogue of Zacharias Scholasticus; he wrote a dissertation on the satire of the Boeotians: ' Liber de satyrarum Latinae natura et ratione, item paraphrasis perpetuas et commentarium uberrimum in X satyram Juvenalii,' Padua, 1744; he edited the poems of Sannazaro, with a biography of the author; he published a new edition of Dante; and he wrote three books of Latin poems, to which he added those of his ancestor and namesake Gian Antonio Volpi, the elder, who was bishop of Como and was one of the Fathers of the Council of Trent. Volpi was for many years professor of philosophy and of rhetoric in the University of Padua. In his old age he became blind, and he died in 1759. His brother Gaetano Volpi edited Sallust in 1722, and he was an active assistant to his brother at the press. He wrote an account of their joint labours: ' La Libreria dei Volpi o la Stamperia Cominiana.' Giuseppe Comino having died in 1752, his son Angelo Comino continued to carry on the business. Another brother of Volpi, named Giuseppe, undertook the continuation of Cardinal Corrini's great work, ' Vetus Latinum profitum,' which he completed.

(Tiraboschi, Storia della Letteratura Italiana, with the continuation by Lombardi.)

VOLTZIA, a genus of fossil (coniferous?) plants which occurs in the Magnesian limestone of England, and in the new red sandstone of Germany. (Bromniart.)

VOYAGE. [Ships, P. C.; Bottomy, P. C.]
WACE, ROBERT, MASTER. The name of this early Anglo-Norman poet is variously written in different manuscripts of his poems, and in the ancient writings which make mention of him. The most usual forms are Wace, Gasse, Gacos, Guisse, Hauce, and Huistace, names which appear to be abbreviations of Wacostche or Huistace. His Christian name is likewise doubtful, as he never styles himself otherwise than 'Master Wace.' Du Cange supposed it to have been Matthew, and Huet is the first writer who calls him Robert. He was born in the island of Jersey about the year 1112, and received his early education at Caen; he completed his studies, which appear to have been chiefly connected with the clerical profession, during a residence of some time in the territories of the King of France, and he afterwards returned to Caen, where Henry I. usually held his court. In this town he spent the greatest portion of his life; his chief occupation was the composition of metrical romances, so called from their being written in the Roman or vulgar dialect. The 'Roman du Rou', which he completed in 1160, was dedicated to Henry II., and was presented to him by Wace in person, who was rewarded with a canonry in the cathedral church of Bayeux; this poem immediately excited the attention of the French, and the public through the agency of the poet Michael of Henry II. He complains, however, and that somewhat bitterly, that the reward he received from the Duches of Normandy neither answered his anticipations nor came up to the promises they had made him. He is said to have died in England, about the year 1184.

The principal details in this brief notice of the life of Wace, are given to us by himself in his 'Roman du Rou.'

The rhymed chronicle from which this extract is taken is entitled 'Le Roman du Rou (Rollo) et des Ducs de Normandie,' and is the best known of the writings of Wace; it is held in high esteem as a monument of the language and as an historical document, which, though incorrect in some of its details and sometimes inexact in its dates, presents a faithful picture of society during that period. It contains the history of the Duches of Normandy from the first invasion by Rollo down to the eighth year of King Henry I., and not simply, as Haucler states, the narrative of the battle of Hastings and conquest of England by the Normans. In the first, or introductory part, written in lines of eight syllables, and presents us with the history of the first irruption of the Normans into England and France. The second part or section is written in Alexandreine, and relates the principal events which took place in the reign of Rollo; the third, in the same metre, the history of William Longsword and his son Richard, the first Duke of Normandy of that name; in the fourth part, which is the longest, he traces the three predecessors, he remarks the eight-syllable measure, and presents us with a sequel of the history of Richard, and that of his successors to the year 1106. [NORMANDY, P. C.] The whole poem contains exactly 18000 verses. He generally follows Duoden and William of Juinangles as his guides in the relation of his particular facts, but he adds many interesting and curious details which he reports as having received from his literary friends.

His description of the battle of Hastings [WILLIAM I., P. C.] is given with considerable minuteness of detail, and has been largely drawn upon by succeeding historians. Amongst the most noted is the English labourer, Wace says that they could not fight on horseback, nor shelter themselves under a buckler with one hand, while with the other they directed their blows against the enemy.

The other recognised poems of Wace are—1. 'Le Brut d'Angleterre,' a work which preceded his 'Roman du Rou.'

The date of it is ascertained by the following lines near the end of the poem:

* Pois ke Des 7 interration
Poir poce name reditation
M.C.L. et cing ans. (1123)
Plut mettre Wace en roman.

The principal incidents in it are derived from a Latin translation, by Geoffrey of Monmouth, of a poem composed in the dialect of Lower Brittany. The subject of it is a certain Brunus, who is imagined to have been the great grandson of Roesa, and who ruled over Great Britain. It contains nearly eighteen hundred lines, in the same metre as those above quoted, and is by some supposed to have been the first work containing the origin of Arthur's round table, his knights, and tournaments. [ARTHUR, P. C.]

The next authentic work of Wace is styled 'La Chronique sequence des Ducs de Normandie.' It commences with Henry II. and goes back to Rollo. It is a short poem of only three hundred and fourteen Alexandrine verses, and is published in the first volume of the 'Memoires de la Societe des Antiquaires de la Normandie,' p. 144. It must have been written later than 1173, as it makes mention of the troubles excited in Normandy during that year by the revolt of the sons of Henry II. against their father.

The other recognised poems of Wace possess less interest, and are not so generally known. The first of them is entitled 'L'Establishissement de la Feste de la Conception, dicte la Feste en Normandie; the second, 'La Vie de S. Nicolas,' of which Huet has published several extracts in his 'Theaurus Litterature Septentrionalis.'

The above-mentioned works are the only ones which have been preserved, and on their authenticity no doubt exists, the two other poems have been ascribed to Wace, 'Le Roman du Chevalier au Lion,' and 'Le Roman d'Alexandrie;' but, though they are undoubtedly productions of the twelfth century, they are now generally supposed by the best critics not to belong to Wace's hand.

The manuscripts of his poems are very numerous; there are complete manuscripts of the 'Roman du Rou' both at the Royal Library of Paris, No. 7367, and at the library of the Arsenal; in both of these Royal Library is supposed to have been written in the fourteenth century. The most ancient is in the British Museum, and was probably written in the first years of the thirteenth century; it contains however only the fourth part of the 'Roman du Rou.'

There is a valuable essay on the manuscripts of the 'Roman du Rou' by M. de Brequigny, in the fifth volume of his 'Notices des MSS. de la Bibliothèque Royale.'

In 1827, there was published at Rouen a remarkably fine edition of the 'Roman du Rou,' in two octavo volumes, with very valuable notes, by M. Frederic Pluquet, who had devoted several years to the laborious task of carefully collating the text of the various manuscripts in existence.

The following works may be consulted for a more ample account of the life and writings of Wace:—1. Capefigue, 'Essai sur les Historiens Maritimes des Normands dans les Gales,' 1823; 2. Depping, 'Histoire des Expeditions Maritimes des Normands, 1826; 3. Wheaton, 'History of the Normans,' London, 1831. In these two works there are copious selections from the 'Roman du Rou;' Depping particularly has very Justly appreciated the value of Wace as a poet and historian. 4. Pluquet, 'Notice sur la Vie et les Ecrits de Robert Wace, suivie de Citations extraites de ses Ouvrages,' Rouen, 1824. In this work will be
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found the most complete account of the writings of Wasce. In the 'Guernsey and Jersey Magazine,' London, 1836, vol. ii., p. 89, is to be found a notice of Wasce, which is however chiefly a translation of Plutarch's Life of Varro, which was published from the Roman text by a very interesting analysis of the 'Roman du Rou.' Roquefort, 'Glosarrie de la Langue Romane,' Paris, 1808, 2 vols., will be found useful to the reader.

WAGA'TZ is a large island in the Russian government of Archangel, situated in the Frozen Ocean at the entrance of the Gulf of Kara. It is separated by the Straits of Waigats from the coast, and is about 70 miles long from the head of Nova Zembla. It lies between 57° 30' and 59° 25' E. long. and 67° 20' and 68° 6' N. lat. It is desolate, rocky, without wood, and almost without vegetation; it absolutely barren of all grass, hay, fish, and is inhabited by a few families of Samoelots, and frequented by the Russians for the sports of hunting and fishing. Some old accounts speak of mountains connected with the Ural, and a map indicates a mountainous chain, which corresponds with that on the continent. There are some other islands, Mal'digef, Dolgoi, and Blinof in the Straits of Waigats, which are small, desolate, rocky, low, without wood, and only frequented by the Samoelots and Russian fur-hunters. The strait was discovered by the Dutch in 1594, who were endeavouring to find a new way to China. (Isselbl, Handbuch; Stein, Lecom.)

WALKING WHEEL is a cylinder which is put in motion about an axle by the weight of men or animals; it is used for the purpose of raising water, grinding corn, and for various other objects. It is probable that a wheel so put in motion was employed in the East, in a very early age, to raise water; for Moscs reminds the posterity of Israel (Denteneronomy xi. 10), that in that country they saw 'water brought out and 'gaz' as a garden of herbs; and in China walking wheels are used for raising water to the higher grounds on which rice is grown. In a treatise on machines, which was published at Eisleben in 1661, there is a description of a walking wheel which was used for grinding corn; it consisted of an inclined plane of a circular form, and turned upon an axle placed obliquely to the horizon, the axle resting at its lower extremity in a gudgeon firmly fixed to the ground; and at its upper extremity, one which was attached to a part of the building in which the machinery was contained. The wheel or plane was made to revolve on its axis by men, who, while stepping on its upper surface, pressed with their heels against horizontal rail and with their feet along slugs of wood which were nailed to the surface in the direction of the radii; and, below the wheel was a pinion whose leaves, acting against the cogs of a trundle on a horizontal shaft, gave a revolving motion to the machinery.

A similar kind of walking wheel was at one time proposed in this country, but it does not appear to have been much used: it was provided with a brake which was made of a heavy and rendered immovable at the will of the person employed to give it motion; and consequently the danger of accidents from a failure of the machinery might be considered as obviated. Such a wheel could be used by a man who might place it on the ground, and put his power in equilibrum with different degrees of resistance; thus, when the resistance is great, he may walk near the circumference of the wheel, and when small, he may find a place near the centre at which he will act with most convenience to himself; but a serious objection to it is, that the force arising from the weight of a man being oblique to the surface of the plane, its effect in giving motion, compared with that of an equal weight applied at the circumference of a vertical wheel of equal diameter, is only as the sine of the inclination of the plane to the horizon (about 30 degrees) to unity; therefore the former effect is only about half of the latter. The weight of the man or men employed to walk on a large wheel of this kind causes its plane to bend; and when, in order to prevent this effect, the wheel is supported by vertical props, the friction is greatly increased, notwithstanding the application of friction rollers at the points of support.

Wheels for drawing water from deep wells, as well as for other purposes, were at one time constructed in the form of two or more hollow cylinders, which were hollowed out of a tree, the hollows being connected with passages, through which the water issued. The wheels were used by the women of menaries or animals moving on their concave surfaces; they were of considerable dimensions, sometimes about 15 feet in diameter, and had an advantage over the inclined plane in being less liable to get out of order. The weight of the moving agent, a horse or a man, could not, however, be made to act on the circumference at a point more than 20 or 30 degrees from a vertical line passing through the axle, or where a tangent to the circumference makes an angle of 25 or 30 degrees with the horizon, and consequently the effect of the moving power compared with that of an equal weight applied at the extremity of a horizontal diameter, is only as the sine of that inclination is to unity. Two ranks of men were sometimes made to walk in the wheel behind one another; when, since the rear-rank men were necessarily at a less distance than those in the front rank from a vertical plane passing through the axle, their weight might have been still more disadvantageously applied. The lives of the men employed to give motion to such wheels were evidently in great danger on any accident happening to the machinery.

In the year 1803 the late Mr. David Harkness, then in the service of the East India Company, obtained a patent for a wheel which turned on a horizontal axle by men on its convex surface; the wheel was six feet in diameter, and projecting about 3 feet 6 inches from its surface. It was constructed of boards or steps whose planes, if produced, would pass through the axle. On these boards the men trode as in the act of ascending steps, keeping themselves in vertical position very nearly at the extremity of a horizontal diameter of the wheel; consequently in the most advantageous circumstances for the application of their weight. Above the wheel were fixed a number of vertical bars, by holding which the men

(WAL) 701. A genus of Lycocoid fossil plants from the coal and oolite formations. (Sternberg.)
might keep themselves steady; a number of bars were also made to project horizontally from a fixed beam above the wheel, at about three feet from the board on which the foot of the man was placed in stepping; and taking hold of two of these, pulling upwards as if he were lifting two bodies from the ground, a man might add his muscular energy to his dead weight, so as to on emergency to press vertically with a force amounting to double that weight. The circumference of the wheel is about 19 feet; and in normal use, by means of a rope and weight of 1,930,000 pounds raised one foot vertically, or about 365 pounds raised one mile. According to the experiments of Coulomb, the daily action of a man ascending stairs unaided is equivalent to 201 pounds raised one mile vertically. [Animal Strength, P.C.S.]

The Tread-Wheel which has been introduced by Mr. Cabot into prisons as a means of employing the culprits in useful labour is of the same nature as that which has just been described [Transportation, P.C., p. 150]. These wheels, which are about 5 feet in diameter, vary in length from 8 to above 20 feet, and they are connected with machinery for grinding hemp, or hemp.
In 1754, he was appointed to the command of the squadron destined to co-operate with the expedition of Colonel Clive [Clive, Robert, Lord, P. C.] in the East Indies; and soon after his arrival in that country he received his Majesty's commission appointing him a captain of the red. His first exploit was the reduction of Fort Geriah, which was held by a piratical prince, who had for many years annoyed the English trade in the East Indies. The service was performed by Admiral Watson on the 12th of February, 1757. In this engagement he and his brother, with the wives and children of this prince, who had become his prisoner, was marked by the most courteous humanity. In the attack made by the French ships of the line to assist the Bengal, in conjunction with Admiral Pocock, he commanded the small fleet of only three ships of the line destined to cooperate with the French. The French had prepared to resist him by sinking several large vessels in the river below the fort; but the admiral having found a safe passage by carefully sounding as he approached, directed so severe a fire upon the enemy's defences, that, seconded by Colonel Clive's batteries on the shore, the place capitulated in less than three hours (24th of March, 1757). By the capture of this fort, a large number of prisoners, one hundred and eighty-three pieces of cannon, and a considerable booty fell into the hands of the English. With this exploit may be said to end this admiral's short but successful career; on the 16th of August 1757, he fell a victim to that unhospitable climate. His death was received with the utmost regret at the court and private; but his amiable character, his military abilities, and his high merits, are his best epitaph. His brother, a well-known poet, was admired for his skill and bravery, and beloved for his moral qualities and amiable disposition. On the 18th of June, 1763, the memory of his services was consecrated by the erection of a monument in Westminster. The inscription is as follows: 'To the memory of Charles Watson, Vice-admiral of the White, Commander-in-chief of his Majesty's naval force in the East-Indies, who died at Calcutta the 16th of August 1757, in the 44th year of his age. The East India Company, as a grateful testimony of the advantages which they obtained by his valour and prudent conduct, caused this monument to be erected.'

(Waterman's Historical Repository, for the years 1758 and 1763; Lives of Illustrious Seamen, etc., London, 1803; Smollett, Continuation of Hume's History of England.)

Wavre is a town in the Province of South Brabant, in the kingdom of Belgium, situated on the river Dyle, in the 30th degree of longitude, and 50th degree of latitude. It has about 4500 inhabitants, who cultivate tobacco, have a considerable trade in corn and cattle, and several breweries.

Wavre has become celebrated by the battles of the 18th and 19th of June, 1815, between the Prussians and the French under General Grouchy. After the loss of the battle of Ligny, Büchter had taken (on the 17th) an advantageous position with the rest of the 3rd corps. The French, however, were not prepared to wait for the 10th corps coming from Lière, partly to effect more easily his junction with Wellington, who had engaged to maintain as long as possible the position at Mont St. Jean, while Büchter hastened to support him with the 3rd corps of the Russian army. The whole army, except the 3rd corps, was already on the march, when Marshal Grouchy with a far superior force suddenly appeared and attacked the town of Wavre.

General Thielmann immediately turned to meet him, but the other corps continued their march. A severe action between Thielmann and Grouchy was interrupted by the night, and renewed the following morning; when both parties, having learnt the result of the battle of Waterloo, retreated.

(Hassel, Handbuch; Stein, Geographical Lexicon.)

WAX-MODELLING. Wax has been in all ages an important agent in the art of statuary; and in the formative art generally, whether as a fine art, or for the purposes of science. In statuary it is used in making the models for the metal cast, but more formerly than at present, for now clay is frequently substituted in its place: it is however still used by silversmiths in casting cups and other cylindrical or spherical objects, especially such as are required to be kept from the markings of joints, to avoid injury to the design or embossed work. In fine art it is used in forming imaginary objects, and in the decoration of basi-reliefs; and it is also very usefully and largely applied in the preparation of anatomical models, especially in pathology, and in the preparation of fruit, flowers, and many objects of the natural history. A good article of wax is described, as a fine art, is frequently termed the ceroplastical art (ceroplastica, from ἐγκαταστάσεις, and ἀρτος, the art of fashioning into forms).
WAX

Wax was formerly indispensable in metal-casting, though when and how it was first used is wholly unknown. It may have been used for the models of solid casts in the earliest periods. Wax was generally used in hollow casting, which was a later invention, and which will presently be described; though of an art so entirely practical, no description can convey more than a general idea of it.

Different writers of different ages give various directions for the preparation of the wax to be used. Vasari, who doubtless mentions that used in his own time, recommends the admixture of a little tallow, turpentine, and pitch, with the commonest vegetable wax. This was then coloured with a little red ochre in powder, which must be mixed with the wax in its liquid state. It may be made any other colour in the same way. A French mixture is—to one hundred pounds of yellow wax, ten pounds of turpentine, ten pounds of pitch, and ten of hog's-lard, which probably would be similar in its properties to the mixture described by Vasari. When the wax is melted, great care must be taken that it does not boil, or it cannot be required when cold. M. Fiquet, in his 'Art du Mouler et Plâtre,' of which there is an abstract in Panckoucke's 'Encyclopédie Méthodique,' gives the following compound for founder's wax—to four of wax, mix one of tallow, one of tallow, and one of Burgundy pitch, which when melted together are fluid and manageable. This was probably the composition used by J. B. Keller and Girardon in preparing the mould for Girardon's equestrian statue of Louis XIV., which was cast entire, or in the 'Sartiello.' Several other mixtures are and were probably employed by different sculptors; the above however were those employed in France and Italy in the great ages of founding, when the wax method was generally in use. Wax may now proceed to describe the methods of its application.

Andrea Verrocchio, a celebrated sculptor of the fifteenth century [VERROCCHIO, P. C.], is said by Vasari to have been one of the first among the moderns to introduce casting from moulds taken from life, or, in Vasari's words, to bring the practice into general use—'che fu de' primi che conociassa e metteva in uso' (ed. 1668). These casts he made in wax and in plaster; and some writers have spoken of him as the inventor of moulding from the human figure, and others even as the inventor of casting in plaster; neither of which is said nor could have been intended to be conveyed by Vasari. Many arts have been known, and occasionally practiced, before they have been applied to the ordinary uses to which they were well adapted. There is in Florence still preserved in the cathedral a cast thus formed from the head of Brunelleschi, which being examined and remarked, must have been taken with Verrocchio was only fourteen years of age. And with regard to casting in plaster, if metal casts were made long before the time of Verrocchio, it is more probable that plaster casts were also made. The first distinguished Italian founder of modern times was Andrea Pisano [PIANO, P. C. S., p. 426], who modelled the gates of the Baptistery of St. John at Florence, which were cast by some Venetian founders. In 1332. The same sculptor had previously sent by Giotto a present of a bronze crucifix to Pope Clement V. (1305-1314) at Avignon, which must have been about 120 years before Verrocchio was born. This crucifix is represented as having been of excellent workmanship; it must have been fashioned consequently by an artist or artists well acquainted both with mould-making and with casting, and the idea therefore that either art can have been ever practiced at so late a period as Verrocchio is quite untenable. The fact of bringing artists from Venice to cast the gates of the Baptistery of St. John does not so much show that Florence was without good metal-founders, as it shows that Verrocchio had obtained sufficient for his own works of this class. William Austen, a celebrated English founder, was anterior to Verrocchio. [AUSTEN, WILLIAM, P. C. S.] Bell-casting, which was practised throughout the middle ages, is not so well understood as iron casting, the latter art in its process is of quite a different character from the modeling of works of imitative art. However, at whatever period and by whatever process the early Italians first prepared their moulds, it is evident that they must have obtained in all works the consequence used wax in the preparation of the model for the casting. The ancients and Romans also most probably used wax for the same purposes. There are few ancient illustrations of this art; the most notable of these is the equestrian statue of Marcus Aurelius before the Capitol at Rome. This monument is hollow, and cast in two parts; and probably the ancients method was not very different from that described by Verrocchio. The weight of the model and mould was on the following plan:—When the model of the statue was finished, a safe mould of plaster and brick dust was made from it, in many parts. [MODELLING, P. C. S.] Each of these parts, being marked and numbered, and removed from the model, was then oiled, and carefully filled on the inner side to a certain thickness, an inch or two, with the modelling-wax already described; the thickness depending upon the height or position of the parts, the larger parts being the thickest, for the metal is destined to fill exactly the space occupied by the wax. When all the parts of the mould were thus prepared, the whole was again put together, the plates being supported by wooden strakes to support it firmly in each direction; the lowest parts of the mould being first placed, and the joints of the wax of the various contiguous parts being filled in, and the pieces carefully united as the cement was softened. When this process had proceeded. When the whole was put together, it was bound on the exterior with strong bars of iron attached to the extremities of the bars of the interior framework. The mould is made in a hollow shell, with thick casting of wax all over the proof body termed in English a core (in some books written corps), by the French noyau, by the Germans Kern, and by Vasari the anima. Air-vents must be made in the shell before the casting of the core.

When the core is fixed, the original mould or shell is taken off, and a wax model of the statue appears to the eye. The sculptor now examines his wax model, and improves it where there is occasion and repairs or makes good all imperfections. When it is perfectly finished, the preparation for the founding commences. Over this wax statue a new fire-proof mould is made of plaster, brick dust or sand, cow-hair, and horse-dung, vigorously packed and fixed tightly by the proper number of iron bars, set at first as a fine liquid plaster, is put on in many coats with a brush, and care must be taken that every particle of wax is well covered. When the shape was formed by the covering before the successive coat is put on, and the composition may be gradually made of a coarser mixture. When this new shell or mould is of a sufficient thickness and is properly strengthened with iron bars, it is fixed and kept in position, and then to weigh what you get out of the mould afterwards and to see that they nearly tally. If any wax is left in, there is danger of the mould bursting, independent of the hard unchangeable inederelauing and inedifice for the metal. The quantity of metal is required to be melted accurately ascertained. The great difficulty and long process of melting out the wax was the cause of what is called the wax method of casting first heard of in the bronze statues of the ancients. The quantity of wax to be melted out, the quantity of metal required to be melted accurately ascertained. The great difficulty and long process of melting out the wax was the cause of what is called the wax method of casting first heard of in the bronze statues of the ancients. The quantity of metal required to be melted accurately ascertained.
no longer considered desirable to cast a monument in a single quoin. [Bronsor, P. C.]

When the wax is at length melted out, the mould must be strengthened by brickwork, and the whole pit must be closely filled with coals to prevent the heat from escaping. When the mould is thus filled with metal; the original iron framework, which was constructed before the casting of the core, keeps both the core and the mould in their proper places; and six vents in various parts of the mould permit the escape of the air from the metal. When all is ready, the furnace is opened at a given signal, the liquid fire runs in the channels simultaneously into the mould, and that part of the work which was previously soft wax becomes permanent bronze. The cast is accomplished when the metal pours out from the vents. When cool, the mould is broken away piecemeal, and the metal is exposed. The core is then removed from the inside through an aperture made on purpose; the whole is then repaired and finished by the bronze-workers. [Bronsor, P. C.]

Johann Balthasar Keller, who cast in this method the statue of Louis XIV., was a Swiss, and originally a goldsmith. He was born at Zurich, in 1638, and died at a wax foundry, called the Royal Foundry, in 1720. There is a print of the statue by C. Simon: it was cast in 1699.

It is quite a misnomer by Croiset [L’Art du Moulage, etc.,] that only half a century after the execution of this monument no one could be found who was capable of casting a monument of Louis XIV. for Bordeaux; and the process of casting a core is spoken of by the Mémoires de G. Faubourg, in which it is described as a process practised for four or five centuries, the statue of Louis XIV. in 1699, the practice of the Italian sculptors in and before Vaas’s time was for not so ingeniously as the method just described. The core was not cast, but built up and gaged on an iron frame, and layer by layer in modellling, until it was within the intended thickness of the metal, that is to say, as the core was burnt dry before the successive layer was put on. The composition of this core or anima was the same as that of the mould—a mixture of cow-hair, horse-dung, brick-dust, and plaster. The parts of the mould taken from the original model were now well oiled and each separately filled with wax: these pieces of wax, when hard, were taken out of the pieces of mould and built up against the core, and fitted by judgment and measurement. When the whole wax model was thus built and cemented together with wax, and pins when necessary, the mould for the metal cast, as in the other process, was gradually covered over it, and, when of a proper thickness for the model, each layer was then burnt out, and the cast accomplished as in the other case described. In some casts the metal is made to enter at the bottom of the mould so that in its own weight it will find its way to the top of the figure; when they arrive at the forum, they are scared upon chairs of ivory; and then exhibit the noblest object that can be offered to a youthful mind warmed with the love of virtue and of public glory. For who would not with like concern and delight behold so many illustrious men thus living, as it were, and breathing together in his presence? Or what spectacle can be conceived more grand and striking? The person also that is appointed to baragwine, when he has exhausted all the praises of the deceased, turns his discourse to the rest, whose images are before him; and, beginning with the most antient of them, recants the fortunes and the exploits of every one in turn. By this method, which renewed continually the remembrance of men celebrated for their virtues, the fame of every great and noble action becomes immortal; and the glory of those by whose services their country has been benefited is renouned, and delivered down to future times. (Hampton’s translation.)

This wax-modelling has continued apparently from the time of the Romans until the present day. In the middle ages it was used for the making of wax images. The first modem however of this class noticed in the history of art is Orsino, the contemporary of Andrea del Verrocchio, in the middle of the fifteenth century. Vaas represents the works of Orsino as a wax-model, and says that they were comed to demonstrate the manners and customs of the people, and that he attained, through the advice of Verrocchio, the highest excellence in his art. Verrocchio and Orsino made some interesting figures together, of which three are described by Vaas as something remarkable. The conspiracy of the Pazzi in 1478 was the cause of the production of these figures: they were voted by his friends in commemo-

ration of his escape. Orsino made, under the direction of Verrocchio, three wax images of Lorenzo of the size of life. The frameworks or skeletons of these figures were made of wood and cane, and the heads, hands, and feet were cast in wax, of considerable thickness, but hollow; they were then furnished with hair and glass eyes, and painted in oil-colours to the exact imitation of life; and were draped in clothes which had been worn by Lorenzo; to give the draperies a fixed character. All the figures were altogether life size, and very successful, says Vasari, that they appeared to be living. One of them was placed in the church of the Monaste di Chiarito, in the Via di San Gallo; another in the Ser- viti Church of the Madonna dell' Orazione; and the third in the church of Santa Maria degli Angeli at Assisi. In this Ser- viti church were many other wax figures by Orsino, of all which were marked with an O, in which was an R, and above it a cross; but they have all long since perished. Vasari adds that few works of later wax-modellers were to be compared with those of Orsino, and complains that the art had declined. A few years however after the death of Vasari, Jacopo Vio vivi distinguished himself by a model on slate, in coloured wax, of Michelangelo's Last Judgment in the Six- tine Chapel. It was engraved by Ambrosio Brambilla, and a particular description of it was published in Rome in 1599. — "Discorsi sopra la mirabile opera di Busso-RiUijevo di cer- stuessa con colori, scolpiti in pietra nera, da Jacopo Viovi."

Two centuries after Verrocchio, and one after Vasari, this art was developed in Paris, and was used with the utmost success by Cataneo and Giulio Zunno, born at Syracuse in 1655, to the preparation of anatomical models and pathological examples. Zunno obtained a European celebrity for his two groups of figures representing the different stages of corruption of the human body, and the effects of the plague. He modelled also an anatomical head at Paris, which is described in the Mémories of the French Academy of Sciences, of 1701, the year of his death. (Zunno.)

The first collection of anatomical preparations which was made for the purposes of science is that of the Institute of Bologna, established by Benedict XIV. It was commenced under the direction of Eccelo Betti, and the preparations were made by Giovanni Manzolini of Bolog- na and his wife Anna Morandi Manzolini. Manzolini died at Bologna in 1755, aged 59. There are some of his models in London and in many other cities of Europe. Anna Manzolini obtained still greater celebrity than her husband; she executed all or the greater part of the obstetric models in the Stanza Osteria of the Institute which were prepared under the direction of Dr. Antonio Galli. She also gave public lectures on anatomy in Bologna, illustrating her discourse by appropriate models. She died in 1774, aged 57. (Crespri, Felina Pitrice, where there are portraits of both the Man- zolini.)

There is a still more extensive and remarkable collection of wax anatomical models in the Museum of Natural History at Florence; it was established by the Grand-Duke Leopoldo, and is kept in chambers in which casts are exhibited by various artists, but the principal contributors to its treasures were Felice Fontana and Clemente Susini. The works of the earlier modellers in wax are set apart in a chamber by themselves; here are some of the models of Zunno, among which is one showing the whole anatomy of the human head, similar probably to the one made at Paris.

The Museo Dupuytren at Paris is celebrated for its morbid specimens; it is perhaps the richest pathological collection in the world. It was purchased by the University of Paris, of the heirs of M. Dupuytren, the celebrated anatomist. Most of the works of it have been adopted by the University, and good wax-modellers are numerous. The Museum of University College, London, contains many excellent specimens by the late Mr. William Vau.

These wax models are made in various ways, but the purest wax is used, which is the case also in all works where the wax is the final substance of the work. Different modellers use different compositions; and some allowance must be made for hot and cold wax; what would be suitable for a large model would not be suitable for a small one, and vice versa. The weather might be too brittle for winter use. Some modellers use simply wax and a small proportion of Venetian turpen- tine; others wax, resin, common turpentine, and a little olive- oil. Others use a mixture of 8 parts of wax, 2 of resin, and two thirds of turpentine.

It is seldom if ever used pure, as in all objects to be modelled white or some colour must predominate: for instance in modelling the brain, white in powder must be mixed in the composition, and the same respect must be had with regard to the predominant colour of every object to be modelled.

No strict rules can be given for the process of modelling, as each modeller will soon acquire methods of his own, and generally speaking, stick to them. But we may state his peculiar processes, imagining it to be detrimental to their interests. However, we may speak of general principles. Nearly all wax models are cast from moulds, and the casts only made in a few cases. Some, however, cast in one, others cast in two, and sometimes even in three. The moulds are generally taken from the objects themselves, either in plaster of Paris or in a composition of bees'-wax, Burgundy pitch, and Venice turpentine, with a very small quantity of olive-oil. The two first are nearly of the same consistency; even when cold, if properly mixed, which must be learnt by experience, the mould is elastic or flexible; and if made thin, when cut on the edges can be peeled off the casts in pieces with- out any danger to the cast; in making moulds in plaster of Paris, the object moulded must sometimes be destroyed to render the mould available. Round objects must be moulded in two or more parts. Sometimes when the object is cast in the mould, the mould must be destroyed before the cast can be removed, and in destroying the mould there is danger of de-stroying the cast also; the elastic mould therefore has great advantages in such cases over the plaster mould. When only one view of an object is presented, and it is only slightly convex, the plaster mould is quite sufficient, except the object itself, as the brain, presents a very uneven and delicate sur- face, the mould must be moist with water, but not absolutely wet, or the water would injure the very delicate surface, which occurs in some pathological cases: the mould may be moist- ened by pouring water on it, and keeping it in a dish of water, when it will soon absorb sufficient moisture for the purpose. The mould must not be oiled when any delicate work is to be done, as the oil will dissolve the surface of the wax, and thus destroy the principal aim of the cast. The wax-composition mould must be slightly touched with a soft hair-tool with oil, to enable it to peel away afterwards without the slightest danger to the cast: but to make it harder and more rapid, a small quantity of oil it retains is immaterial.

When the cast and made, and what they call back up (that is, strengthened with a corner composition within), the process of painting commences; but all effects cannot be given by mere colour, some morbid deposits and effects required to be expressed by adding wax of the proper colour with a hair-pencil or other tool. The colouring is done from the natural object repre- sented, with fine hair-pencils and powder colours moistened with turpentine and tempered with a little wax; simple water is also sometimes used as the colouring vehicle. When the colouring is finished, the whole is covered with mastic varnish. In cases where the morbid effects or evidences of disease are of a distinct substance from the healthy texture, different col-oured wax should be used in casting the healthy and diseased portions, and the parts may be corrected by modelling. The same principle is applied in the preparation of anatomical models of natural history, as in preparing anatomical models: but fruit, which is generally in full or high relief, will require piece-moulds, that is, to be moulded in several pieces, which is done half or part at a time. Flowers are not all cast at once; they are prepared from leaves of coloured wax made expressly for the purpose. These leaves are cut the required shape; they then, with the necessary colour and a hair-pen, receive their local tints; and are finally joined and fashioned into the re- quired flower. Insects are modelled by combining the two processes. In moulding objects with hair or delicate raised ornament, the cast is very carefully prepared, and the collection is then made, unless they are wet. Dry firm objects may be moulded without oil; the plaster must be removed as soon as it is set.

It remains yet to speak of the mode of making images. These are made in various ways, but the purest wax is used, which is the case also in all works where the wax is the final substance of the work. Different modellers use different compositions; and some allowance must be made for hot and cold wax; what would be suitable for a large model would not be suitable for a small one, and vice versa. The weather might be too brittle for winter use. Some modellers use simply wax and a small proportion of Venetian turpen- tine; others wax, resin, common turpentine, and a little olive- oil. Others use a mixture of 8 parts of wax, 2 of resin, and two thirds of turpentine.

It is seldom if ever used pure, as in all objects to be modelled white or some colour must predominate: for instance in modelling the brain, white in powder must be mixed in the composition, and the same respect must be had with regard to the predominant colour of every object to be modelled.
the checks, lips, and eyebrows; the whole then may be covered with wax, which must be poured over it two or three times, until the surface is well covered; it regularly may be secured by re-heating and melting of the wax and asbestos; it runs in usual means of a hot iron or burner (called cautery by the antients) which must be held near it until the whole has a uniform brown color. The paper or the block will show through with the wax, and the head will require but the hair, the eyes, and a few local touches to finish it. Masks may be also dipped in wax, or the wax may be put on with a hair-tickling brush to the mask or keps; or a wax-fig and may be backed up or strengthened with strong paper pulp. There are however other methods of modelling wax figures, but no method can be properly explained by a verbal description. With a few pieces of the celestial sphere it may be reconstructed and it deserves to be remarked that in this work we find the first notice of the method of determining geographical longitudes by the angular distance of the moon from some star; he recommends, for this purpose, a new instrument which has long since been disused by mariners. In 1522 he published at Nürnberg, in 4to., his 'Opera Mathematica,' in which is contained a tract on conics; he also published a work on Trigonometry, in five books, containing a great number of astronomical and geographical problems.

Werner wrote explanations of the construction and use of meteorological instruments; and it is said that he collected a number of observations with a view of discovering from them rules for determining the changes which take place in the atmosphere. He executed a machine in which the movements, s. a., were made to resemble formally to the Ptolemaic system; and he wrote a work on The Movement of the Eighth Sphere. He died in the year 1529.

(Historia Astronomia, by Weidler; Histoire de l'Astronomie Moderne, by Delambre.)

WESTERN PORT. [WALES, NEW SOUTH, P. C.] WETHERELLIA, a genus of fossil fruits from Sheppy. (Bowerbank.)

WHITSTONE, GEORGE, a voluminous writer of prose and verse, lived in the latter half of the sixteenth century. Both the place and time of his birth are unknown; but he is claimed kindred with Sargent Plantagenet of the family which held property in London. His history was that of a succession of misadventures. He began by wasting his patrimony in seeking a place at court: he then served abroad as a soldier, and was an eye-witness to the fall of Sir Philip Sidney at Zutphen; he next returned to the abortive expedition of Gilbert to Newfoundland; and, finally, returning to England, he appears to have been chiefly occupied in the course of the rest of his life in literary labours, of which he had previously practiced occasionally, and now attempted with indifferent success as a means of subsistence. He is now chiefly known as having been the author of the two plays of 'Curse upon Eggs and Cobweb,' which, having been printed in 1578, ranks as one of our earliest extant comedies; though it has the further interest of having the same plot with Shakspere's 'Measure for Measure.' It is said to have been written between 1577 and 1579. In Chalmers's English Poets, Whetstone's Life of George Gascoigne: of his other works, a curious account, with specimens, will be found in Mr. Coller's 'Poetical Decameron.'

WHITE, REV. JOSEPH BLANCO, was descended paternally from an Irish Roman Catholic family. In the early part of the last century, William White came over to Seville, in Spain, where he succeeded to the then flourishing business of an exporting merchant carried on by his mother's brother. He was raised by the king of Spain to the rank of the nobleman, his posterity retained. But after his death the business fell into the hands of his son, the house failed, and the family were left for a time with very limited resources. This son had married a Spanish lady of the name of Crespo y Nere, connected with the old Andalusian nobility; and Joseph Blanco White, commonly designated in Spain Don Jose Maria Blanco y Crespo, who was born at Seville, 11th July, 1775, was their son.

The commercial business of the family had been re-established after the bankruptcy, and Joseph was placed in the first instance in his father's counting-house. When he was about twelve years old, however, his parents complied with his own desire of allowing him to be educated for the church. In the year 1800, he was a student in the college of Seville in the profession to which he had thus chosen soon took possession of him. He came to England in March, 1810, and spent the remainder of his life in this country. The same year he set up in London a monthly periodical work in Spanish, entitled
William Frederick I, King of the Netherlands, Grand-Duke of Luxembourg, Prince of Orange Nassau, was born at the Hague on the 24th of August, 1772. His father, William V, King of Orange-Great Britain, was descended from John the younger brother of the great William I. of Orange, and died at Brunswick, April, 1806. His grandfather William IV., the first Hereditary Stadtholder of the United Netherlands (from 1748 who died in 1751), had re-united the possessions of the four branches of the line of Nassau—Orth, Hadamar, Siegen, Dillenburg, and Diem, with his own branch, that of Diem. His mother was Frederica Sophia Wilhelmina, daughter of Prince Augustus William of Prussia. In 1778 he made a journey to Germany, and passed some time at the court of his uncle Frederick William I., who died in 1785, for a marriage.

After his marriage on the 1st of October, 1791, to Frederica Louisa Wilhelmina, daughter of Frederick William of Prussia, he, in conjunction with his brother Frederick, succeeded to the title of Grand-Duke of Luxembourg, and as such was invested with considerable and extensive powers in the Dutch army; but many impediments were occasioned by internal dissensions, the patriots, who had been put down in 1787 by a Prussian force, secretly intriguing against Hesse-Cassel. Governor-Prince of Orange, who had taken refuge in France, and on the 1st of February, 1798, the National Convention declared war against the Stadtholder. Hoping with the assistance of the patriots, to obtain possession of the rich provinces of Hesse-Darmstadt, composed Dutch Brabant, which was however recovered by the hereditary prince, who was commander-in-chief of the Dutch army, which was joined by a body of the allies, after the victory of Neerwinden on the 18th of March, which had been gained over Duhmusschu by the Austrian army under Coburg. The hereditary prince then hindered the French army of the North from penetrating into West Flanders; but on the 18th of September he was attacked in his position between Menin and Dunkirk by the Austrians, and was driven back with the most gallant resistance, in which his brother Prince Frederick, who commanded the right wing, was wounded, he was obliged to retreat behind the Scheldt. Soon after this the hereditary prince received the devolution, and then, the provisions of the Austrian army, drove the enemy beyond the Sambre; but in the great battle of the 16th of June, 1794, the French having taken Charleroi by storm and defeated the prince's left wing at Mons, he was again obliged, by the directions of Prince Coburg, to retreat. The Austrians retreated, before the French and Jourdan, behind the Meuse; and the hereditary prince, with his weakened army, had no alternative but to cover the republic and to connect the army of the Duke of York, and to the south he fell, and the frost enabled the enemy to pass the Waal on the ice, so that Pichegru entered Utrecht on the 17th of January, 1795. The party of the patriots favored the enemy, and the stadtholder was unable to save the republic, forsaken by its allies. His sons had resigned their commands on the 18th of January, and William V., with his family and court, left the country for a few days; but on the 19th of January he returned to Utrecht. On the 20th of January he surrendered the Dutch and Spanish Journal, 'Las Variedades,' which was published quarterly, and continued for about three years. Other separate works followed, both in Spanish and English; those among the latter that attracted most attention being his 'Practical and Internal Evidence against Catholicism,' 1826, and again 1826; 'The Poor Man's Preservative against Popery,' 1825, several times reprinted; 'Second Travels of an Irish Gentleman in search of a Religion,' (in answer to Moore's well known work) 2 vols. 12mo., Dublin, 1833. He was also an occasional contributor to the 'Quarterly Review,' to the 'London Review,' established in 1829 (of which he was the editor for the first 18 numbers), to the 'Dublin University Review,' and to the 'Journal of Education' (in an early number of which he wrote one article on the State of Education in Spain), to the 'Dublin University Review,' and to the 'Quarterly Review.' He resided occasionally at Oxford and Dublin as well as in London; and in 1850 he settled in Liverpool, where he continued till his death, which took place on the 30th of May, 1851. He left a son, who, in 1840, was a major in the English army. Of W. G.'s writings probably those that will last the longest are the papers which have been published since his death under the title of 'The Life of the Reverend Joseph Blanco White, written by himself,' with posthumous additions, edited by John Hamilton Thom, 3 vols. 8vo., London, 1845.
and others, were exerting themselves at Amsterdam, the Hague, Rotterdam, Zwolle, and other places, to effect the resurrection of the house of Orange. William was at that time in the Netherlands; the mutiny had been occasioned by the revocation of the Edict of Nantes, for the support of the Netherlands. When the victories at Leipzig approached the frontiers of Holland, the inhabitants of Amsterdam rose on the 16th and 17th of November, and one of the first measures of the insurgents was to proclaim William as king. This prompt resolution of the Dutch patriots to seize the opportunity of recovering their independence was attended with the most important consequences. The prestige of the nation, which had been so often defiled, was re-established; but France still had great resources; the formidable barrier of the Rhine was not yet passed, and when that decisive step should have been taken it might be followed by an immediate war in which France would never venture to think of crossing the Rhine before the return of spring. What might have been the consequence if the allies had waited till the spring, instead of carrying the war into the winter? It is true that, before the end of December, the insurgents in Holland might have brought about such a change in the situation of the Allies as would have deprived the French of a field of action during the winter; but so much time to Napoleon, may be inferred from what actually happened in the wonderful campaign on the banks of the Seine and the Marne in 1814, in which Bonaparte displayed all his extraordinary resources as a military genius.

As soon as William learnt what had passed, he embarked on the 29th of November, and landed at Scheveningen on the 29th. He was received with acclamations by the people of the Netherlands, and was immediately recognized as Amsterdam, where Kemper and Scholten, the commissioners of the provisional government, had issued on the 1st of December a proclamation, announcing 1 Holland is free,' and 'William I, the sovereign Prince of this free country.' The prince gratefully assented, and declared that a constitution must guarantee the rights and liberties of the people, and secure them against all encroachments. Twenty-three fortresses were still in the hands of the French, who were encamped near Utrecht, but the army of the allies, and the volunteers, who were called to arms, occupied the country. William hastened the armament of the people, and appointed a commission to negotiate a truce. The treaty was signed on the 29th of March, 1814, by the deputies of the people, and then sworn to by the prince. He had already taken possession of his hereditary dominions in Germany, before the end of August, and the prince of Orange, the kings of Belgium and Liege, together with the Seven United Provinces, should be formed into one kingdom, and on the 16th of March, 1815, the treaty was concluded at the Hague. The union of the Netherlands and Duke of Luxembourg. But he was obliged to cede to Prussia his hereditary possessions in Germany for Luxembourg, which after the 22nd of May, 1816, belonged to the German Confederation, and which he now raised in May to the rank of a grand-duchy.

The union of so many provinces, the inhabitants of which, though of the same origin, differed very much in manners, customs, and institutions, made it necessary to do something to make the new constitution necessary. A commission, consisting of an equal number of Dutch and Belgians, was appointed to make such changes as were requisite. After the king had approved of this commission, it consisted of the British government and deputies from the southern provinces, and finally proclaimed on the 26th of August. In 1814 the king founded the military order of William, and in 1815, after the battle of Waterloo, a Belgian Legion, called the Junta. On the 30th of June, 1816, joined the Holy Alliance. He resided alternately at Brussels and the Hague. On the 17th of May, 1816, a Dutch fleet, under Admiral Van der Capellen, joined the British fleet, and compelled the day to conclude a treaty, by one article of which all Christian slaves were to be restored to liberty.

In the interior of the kingdom, a want of harmony between the inhabitants manifested itself on several occasions, which, but for the moderation and firmness of the king, might even then have led to serious dissensions: the unbounded influence of the Roman Catholic clergy, even over the higher classes in Belgium; the mutual jealousies and conflicts of the different provinces; the dissatisfaction of the latter with the long residence of the court at Brussels; divisions in the northern provinces between the friends of the old republican system and those of the new or monarchy, and lastly the necessity of providing against the danger that was kept within bounds only by confidence in the character of the king, and the mild conciliatory principles of his government. In the foreign relations the government, in the main, succeeded; the British government, the Grand-Duchess Anna of Russia improved the connexion with that empire, but especially weakened the interest taken by England in the affairs of the Netherlands. Some differences had arisen with Prussia, with which kingdom a closer union was however caused by the marriage of Prince Frederick to the Princess Louisa, daughter of the King of Prussia, on the 21st of May, 1825.

The union with Holland and various commercial treaties with foreign powers had given an extraordinary impulse to the manufactures and commerce of Belgium, especially of the cities of Antwerp and Ghent, but the government could not succeed in blending the Dutch and the Belgians into one nation. Their mutual aversion was manifested with great acrimony in the church, in the army, and even in the assemblies of the States general. The intolerance of the Roman Catholic clergy, encouraged by the Papal nuncio in the Netherlands and the Jansenist bishops of Utrecht, Haarlem, and Davenport, who had taken the oath of allegiance to the king, and the prohibition of the French language in all judicial proceedings, created great irritation in the southern provinces, and the conservative party was not satisfied, and was necessary to modify it in several points; and besides these important differences respecting religion and language, there were several financial points in which the interests of the northern and southern provinces clashed; and which, notwithstanding several very beneficial measures, could not hinder the final separation of the two parts of the kingdom. The union of Belgium and Holland had subsisted for fifteen years. The cities, the manufactures, and the commerce of Belgium, had attained the highest degree of prosperity, but nothing could conciliate the refractory spirit of the Belgians with the phlegmatic character of the Dutch, nothing could conquer the aversion of the people of Brabant and Liege, founded on differences in manners, religion, and language, from Protestant Holland. The July Revolution in France revived the old mutinous pride of the Belgian cities, and a rising of the mob in Brussels, on the 24th of July, 1830, commenced the revolution which separated the northern and the southern provinces. In consequence of a second insurrection in Brussels, on the 20th and 26th of September, the national party rose, and the conflicts arose between the government and the insurgents. King William, the armed insurgents, commanded by foreign officers, which ended in the retreat of the Dutch. Meantime the king, yielding to the desire of a Belgian deputation of the 18th of September, had been driven from Brussels, and on the 13th of September to discuss with them the question of a separate administration, and an alteration of the fundamental law. The two chambers were in favour of it, but the insurgents, supported from Paris by the Propagandists, contended for a total separation, which already existed in fact, when the five powers, Great Britain, France, Austria, Russia, and Prussia, imposed a cessation of arms on both nations, and, by the protocol of the 4th of November, 1830, recognized the independence of Belgium. This is not the place to inquire into the motives which induced four of the great powers, instead of executing these engagements, to conclude a treaty of peace and alliance, by which they, had they themselves erected as a security against the future encroachments of France, to unite with France in demolishing their own work. But justice requires us to acquit the king of this crime, and to interpret the occasion as was dictated by honour, good faith, and regard for the interest of all, and far from prejudicing the rights or legitimate interests of any government, it entitled him to the esteem and gratitude of all the cabinets of Europe.

King William protested, on the 12th of July, 1831, against the eighteenth articles presented by the great powers, particularly against the last, which would have excluded the Belgians from the alliance of the Netherlands, with extraordinary enthusiasm, resolved to have recourse to arms; not to obtain a re-union with Belgium, which it did not wish, but for the assertion of its rights. On the 2nd of August the Prince of Orange, at the head of 70,000
men, crossed the Belgian frontier; Turnhout and other places were taken; one Belgian army was defeated near Hasselt on the 17th; another again near Louvain on the 10th; but a French army advanced by forced marches, and the English and French ambassadors at the court of Brussels negotiated an armistice, according to which the Prince of Orange evacuated Brussels on the 14th, and laid down his arms before the war. A treaty in twenty-four articles was then proposed by the London Conference, which was acceded to by Belgium, but rejected by King William. Russia, Prussia, and Austria having also acceded at the same time to the armistice, and being able to undermine the said treaty, it was modified; but France and England had recourse to measures of coercion. England blockaded the coast of Holland, an embargo was laid on the Dutch ships, and the citadels of Antwerp were bombarded between December and January. This memorandum, with the French invasion, was a serious blow to the situation of the Dutch and Belgian army. It did not immediately lead to peace between Holland and Belgium, but a suspension of arms was effected on the 21st of May, 1832. The London Conference resumed its difficult task; many important questions remained to be settled: an interminable series of protocols ensued; William did his utmost to delay the conclusion of the peace negotiations; he knew of some turn in his favour, and hostilities between Holland and Belgium were on the eve of recommencing at the end of 1832, and were prevented only by the remonstrances of the Conference. At length,7 provoked chiefly by his financial embarrassments, William gave way, and, on the 4th of February, 1839, signed the twenty-seven articles, modified to his disadvantage; and the definitive treaty was concluded on the 19th of April, 1839, by the King of the Netherlands and the Belgian. 7.

But though Holland was now wholly separated from Belgium, there was great excitement in the Dutch Chambers in 1839. There were very active financial laws; numerous judicious reforms instead of which proposals were laid before them for a loan of fifty-six millions of florins. The loan was rejected on the 20th of December, and the budget on the 23rd; a loan of only six millions was granted, and the budget voted for six months only. At the next meeting of the States-General, in March, 1840, the king caused several modified projects of law to be laid before them; in consequence of which the civil list was fixed at one million and a half of florins; and it was resolved to vote the budget for two years only instead of ten as hitherto. But notwithstanding this endeavours of the government to satisfy the people, the discontent with the king and the ministers increased. The king's passion for the Countess Henriette d'Outremont, a Roman Catholic lady, excited the general indignation of the people, so that he declared on the 26th of March, 1840, that he renounced his projected union with her. This affair, and the discovery of an extensive conspiracy in Belgium, in which the Dutch appeared to be concerned, and finally the financial difficulties of the state, induced the king solemnly to resign the government on the 7th of May, 1840, into the hands of the States-General. Under the name of Count of Nassau, with an immense private fortune, he fixed his residence at Berlin, where, on the 17th of February, 1841, he married the Countess d'Outremont, and received the Duchy of Nassau and the title of Prince of Nassau property to his family, besides a gift of ten millions of florins to the Dutch treasury.

(Baron de Keverberg, Du Royaume des Pays Bas, vol. iii. 8vo. La Hague, 1844; Brockhaus' Conversations Lexicon, 1848; Mémoires tirés des papiers d'un homme d'état; Mr. Chalm, Narrative of the Revolution in Holland, London, 1814.)

WILLIAMS, DANIIEL, D.D., a Protestant Dissenting minister of the Presbyterian denomination, was born at Wrexham, in Denbighshire, in the year 1644. The disadvantages of his early education, and even of the nature of his mind, and by his own diligence. He was one of the first of the new generation who entered the Christian ministry after the ejection of the Nonconformists in 1662; and at the age of nineteen he was regularly admitted as a preacher. His first years in the ministry were passed in preaching in several parts of England, though the times were so unsettled that there was little prospect of his continuing his learned profession. This circumstance, however, did not deter him from remaining among the Nonconformists, though his talents and his prudence would have enabled him to enter the church-establishment with a fair chance of advancement; but, on these days, not even granted by the government in Ireland than in England, Mr. Williams repaired to the sister-country, and unexpectedly received an invitation to become chaplain to the Countess of Moth, which he accepted. Some time afterwards he was called to the Dissenting congregation in Wood Street, Dublin. Here he remained nearly twenty years, and filled his station with great credit, being at the same time much respected by the Irish Protestants in general. During his residence in Dublin, it was the desire of an Irish family, with a considerable fortune. Towards the close of the reign of James II., his warm opposition to Romanism exposed him to some danger; and he consequently came to England, where he was received with signal honour, and enabled to live in London, and to be provided with a copy of the King's use of an address upon the king's dispensing with the penal laws. Mr. Williams frequently took his stand with the opposition. He ' never would,' he said, 'concur in laying down the character of the king; his majesty's' support was the question prevalent in the conference of dissenting ministers. He now became the patron of those Irish Protestants who fled to England from the violence of Tyrconnel; assisting them himself, and procuring for them the sympathy and aid of the public. He rejoiced greatly in the Revolution of 1688; and was often consulted on Irish affairs by King William. In 1700 he went to Ireland on his own private business, and to visit his friends, by whom he was warmly received, and whose services in the cause of Protestantism were even acknowledged by some who had been prejudiced against him. About the middle of the year 1700, Mr. Williams purchased the house in Bishopsgate Street. Here he continued twenty-seven years. He was most esteemed by Mr. Richard Baxter, on whose death, in 1691, Mr. Williams was chosen to succeed him at the College of Seraphers. He had a large circle of controversy created parties among the Dissenters connected with this lecture, and Mr. Williams rendered himself obnoxious to those who advocated the tenets of Dr. Crisp, the acknowledged champion of certain Romish doctrines. A reception was prepared at the offices of the said party, and the author was sent for to Mr. Williams' lecture at Pinners' Hall, where he took place, and another Tuesday lecture was established at Salford Hall. On this occasion, Dr. Bates, Mr. Howe, and Mr. Alspoh, who had been among the lecturers at Pinners' Hall, retired with Mr. Williams. On the 1st of November, 1736, Mr. Williams' works were reprinted, Mr. Williams, by request, wrote his 'Gospel Truth Stated and Vindicated.' a work of which Mr. Alspoh, in his 'Faithful Rebeck,' says, 'It is fairly written, rationally argued, exactly methodized, and finely designed.' Mr. Stephen Hob having charged this work with Socinians, an appeal was made on both sides to Dr. Stillington, then Bishop of Worcester, and to Dr. Edwards of Oxford, both these learned persons being regarded as masters in that controversy; and they both acquiesced Mr. Williams of the charge. In his 'End of Discord,' wherein is demonstrated that no doctrinal controversy remains between the Presbyterian and Congregational Ministers fit to justify longer divisions, he distinctly states the opinion of the 'Orthodox, the Socinian, and the Antinomian' on the doctrine of the 'satisfaction of Christ,' and he adheres to the views of the first. So great was the value of this work that he added the name of son Williams. Under the name of Count of Nassau, with an immense private fortune, he fixed his residence at Berlin, where, on the 17th of February, 1841, he married the Countess d'Outremont, and received the Duchy of Nassau and the title of Prince of Nassau property to his family, besides a gift of ten millions of florins to the Dutch treasury.
proves that he was in advance of the age among his contemporaries.

Townshend, in the close of the reign of Queen Anne, Dr. William became apprehensive respecting the safety of the Protestant succession, from the measures of the prime minister, the Earl of Oxford; and he renounced on the subject his seat in the House of Commons, on which he had held it for many years. It happened, not long after, that a copy of a letter which Dr. Williams had written to his friends in Ireland on Lord Oxford's measures fell by accident into the hands of a lady who was a close companion of the second volume of his philosophical and religious works, who immediately took the letter to her lordship, who, already displeased with the doctrine for which he had volunteered, now never forgave him. On the accession of George I. in 1714, he left Townshend, and took lodgings on the ad- dress to his majesty, at the head of the London dissenting clergy of the three denominations; and from this time it has been usual for this body to go to court on similar occasions, it being one of the bodies who are received on the throne, and by their committees in the royal closet. Dr. Williams's health had by this time visibly declined for a year or two, though he still continued the exercise of his ministry. At length, after a short attack of asthma, he died on the 26th of January, 1716, in the seventy-third year of his age, and was buried in Bunhill Fields. In his funeral sermon, Dr. Evans, who had been his co-pastor for eleven years, eulogised him as 'a man of inven- tion, a poet, a philosopher, a faithful, a memory, and vigorous affections, which were cultivated by much application to study.' His moderation was shown by his desire for a com- prehensive church Union in which the dissenters should be included. He was acquainted with a large part of the dissenting clergy, and was always kind to such dissenters as would not be included. His great con- scientiousness and his unusual readiness to forgive injuries are also mentioned in his praise. He was accustomed to deliver a lecture to young people on Christmas-day, which was attended by vast audiences from all parts of the town. His discourses and treatises extend to six volumes 8vo, and have been collected and published at different periods: the last volume consists of Latin versions of several of his treatises, translated for the benefit of foreigners, agreeably to the instructions of his will. He also directed that his treatise entitled 'The Vanity of Childhood and Youth' should be rendered into Welsh for the use of schools, and printed often for the benefit of the poor.

Dr. Williams bequeathed the bulk of his estate to benevo- lent and useful objects. Having provided for his widow, he left donations to the Society for the Reformation of Manners; for the education of youth in Dublin; for an itinerant preacher to the native Irish; to the poor of the Wood Street congregation in Dublin, and of that in Hand Alley in London; to the French refugees; to the poor of Shoreditch parish; to assist poor ministers and students; to several ministers' widows; to St. Thomas's Hospital; to the London workhouse; to the Society for promoting Christian Knowledge in Scotland and Ireland; and for the maintenance of charity-schools in Wales. He sold his estates to the university of Glasgow, which at present furnishes six handsome exhibitions to students for the ministry among the poor, and he has not been omitted in his will by his trustees. The last grand bequest in his will was four thousand pounds to the establishment of a public library in London. For this purpose he had bought Dr. Bates's collection of books for between five hundred and eight thousand pounds, to add to his own. He directed his trustees to erect a suitable building, the site for which was purchased by them in 1727, in Red Cross Street; and the library was opened in 1729. All persons may obtain admission on application to one of the trustees. Since the library was established, very considerable additions have been made to it by legacies, as well as by contributions in money and books. It contains upwards of sixteen thousand volumes, and in 1841 a new catalogue was published. Among its most valuable possessions are tracts and sermons which had never been catalogued before.

Dr. Williams's library will be memorable in future time as the source of preparation for many of those noble struggles for civil and religious liberty. The whole of the three denominations continued on both sides to be great social parties, and that state, as it were, second volume of his philosophical and religious works, which were so frequently read by them, was supported by their united efforts brought about the repeal of the Corporation and Test Acts when differences arose, and the want of religious sympathy in the sections of the body began to show itself. In 1815, by the opposition of the Unitarian and Congregationalists, and the remaining orthodox Presbyterians, few in number, alone remained in the connection. The government considerably yielded to the sece- pending party the right of addressing the throne separately under the name of the Presbyterian denominations; and the Congregationalists, the Baptists, and the remaining orthodox Presbyterians are still known and recognised by the government as the 'Three Denominations,' whose meetings are now held in the Congregational Library, Bloomsfield Street.

(Dr. Williams's Works: Calamy's Continuation: Bogue and Bennett's History of Dissenters; Congregational Magazine for 1836.)

WILSON, DR. THOMAS, a noted statesman and scholar of Queen Elizabeth's time, was the son of Thomas Wilson of Stroby, in Lincolnshire. He was educated at Eton and at King's College, and was one of the two sons of the Duke of Suffolk. In 1551 he published 'The Rule of Reason, containing the Art of Logic;' and in 1553, 'The Art of Rhetoric.' Both works were frequently reprinted in the course of the century, and both have received much commendation from modern critics; the latter in parti- cular being held to give the author a title to be considered as the earliest critical writer in the English language. Full specimens of it are given by Watson. On the accession of Queen Mary, Wilson found it convenient to retire to the Continent. He took the degree of doctor of laws at Ferrara; but, on proceeding to Rome, was apprehended by the Inqui- rational and was brought to the scaffold under pretense of being charged with having written certain treasonable writings. On the death of Pope Paul IV. (1565), the discontented populace of Rome broke open the prison of the Inqui- rational; and is said to have been put to death after a period of charge being said to have been found in the works he had published. On the death of Pope Paul IV. (1565), the discontented populace of Rome broke open the prison of the Inqui- rational; and is said to have been put to death after a period of charge being said to have been found in the works he had published. On the death of Pope Paul IV. (1565), the discontented populace of Rome broke open the prison of the Inqui- rational; and is said to have been put to death after a period of charge being said to have been found in the works he had published. On the death of Pope Paul IV. (1565), the discontented populace of Rome broke open the prison of the Inqui- rational; and is said to have been put to death after a period of charge being said to have been found in the works he had published.

WILSON, ALEXANDER, was born at Paisley, in Scotland, July 6, 1766. His mother died when he was ten years of age, and his father, embarrassed with the charge of a young family, soon married. In 1779, Wilson was apprenticed to a weaver for three years, on the expiration of which he worked about four years as a journeyman weaver, and then abandoned the loom, and spent nearly three years as a pedlar. From an early age he had been cultivating a talent for poetry which he imagined himself to possess, and in his excursions for the sake of his wares endeavoured to procure subscriptions for a volume of his poems, but without success. The volume was never published, but verses and single poems were published in newspapers and separately. 'The Laurel disputed,' a poem on the respective merits of Ferguson and Ramsay, he recited before a literary society in Edinburgh, and published the poem in 1791. In 1792, he published a play on his 'Watty and Meg,' which some at first sacristed to be, to the small gratification of Wilson. His poetry however made no impression on his countrymen in general, and he resolved to emigrate to the United States of North America.

On the 14th of July, 1794, Alexander Wilson landed at Newcastle, in the State of Delaware, with a very small sum of money in his pocket, and was reduced to poverty. He was employed for a few weeks by a copper-plate printer; he then resumed successively his former occupations of weaver and pedlar, but after some years became well known as a poet, and ultimately turned printer, and pursued his new avocad- cation at different places in Pennsylvania and New Jersey.

At length, in 1802, he made a contract with the trustees of a
school at Gray’s Ferry, on the river Schuylkill, in the township of Kingsess, about four miles from Philadelphia, and here he became acquainted with Mr. Bartram, the botanist and naturalist, whose gardens were always open to him, and whose conversation delighted and improved the taste for natural history which his turn for observation and his rambling life had developed. Here too he became acquainted with Mr. Lawson, the engraver, who gave him instruction in drawing, providing him with landscapes and sketches of the American figure, but with little promise of his becoming a draftsman, till Mr. Bartram proposed a trial of birds, in which he succeeded beyond the expectation of his friends; and from that time his lifelong passion of his after-life was brought into play. Writing to a friend in Paisley, in June, 1828, he says: "Close application to the duties of my profession, which I have followed since Nov., 1796, has deeply injured my constitution; the more so, that my rambling disposition was the worst calculated of any one’s in this world for the austere regularity of a teacher’s life. I have had many pursuits since I left Scotland—mathematics, the German language, music, drawing, &c., and I am now about to make a collection of our finest birds." In October, 1804, Wilson, accompanied by two friends, set out on a pedestrian journey to the Falls of Niagara. They reached the Falls, and satisfied their curiosity, but were overtaken by the snows of winter on their return. One of his companions remained with his friends near the Cayuga lake, the other availed himself of a conveyance; but Wilson walked on with his gun and bundle, through trackless snows and uninhabited forests, over mountains and along dangerous rivers, and reached home at the beginning of December, after a journey of 1257 miles, of which he walked 47 the last day. All the time he could spare was now devoted to the examination of birds, and making drawings of them in colours. In 1806 Mr. Bradford, bookseller, of Philadelphia, being about to publish a new edition of Rees’s ‘Cyclopaedia,’ engaged Wilson as his Chief editor. Soon afterwards he explained to Bradford his views of a large work on American ornithology, and the bookseller undertook the publication.

Wilson was assiduous in attention to his duties as assistant editor, while at the same time he prosecuted the great undertaking which had become the favourite object of his ambition with an enthusiasm which was characteristic of him. At length, in Sept., 1808, the first volume of the ‘American Ornithology’ was published. From the date of the first arrangement a prospectus had been put in circulation, in which the nature and intended execution of the work were specified, but no adequate idea had been formed of the book which was in preparation, and when the superb volume made its appearance the American public were alike astonished and delighted. It was in folio, with plates carefully engraved from Wilson’s own drawings, coloured after nature, and with admirable letterpress descriptions; the price was 120 dollars. In the course of September, 1808, Wilson journeyed eastward and northward, and during the winter went through the southern States, exhibiting his book and endeavours to obtain subscribers. He visited in fact every town within 150 miles of the Atlantic coast, from the river St. Lawrence to St. Augustine. He received many promises, but few subscriptions. Wilson however was not depressed.

The second volume was published in 1810, and soon afterwards he set out for Pittsburgh on a journey to New Orleans. From Pittsburgh he descended the Ohio by himself in a skiff. He started on the 24th of February, and on the 17th of March moored his boat safely in Bear Grass Creek, at the rapids of the Ohio, after a voyage of 720 miles. His hands had suffered a good deal in rowing. He had made excursions from the banks of the river, as he proceeded, with his gun and drawing materials, in search of new species of birds, of which he made drawings and wrote descriptions of the spots which he shot. He afterwards walked from Louisville to Lexington, 73 miles, and on the 4th of May set out from Nashville for St. Louis through the wilderness on horseback, with a loaded pistol in each pocket, a loaded fowling-piece, belted across his shoulder, a pound of powder in his flask, five pounds of shot in his belt, and some biscuits and dried beef. On the fourteenth day he arrived at Natchez, in Mississippi, after a journey through swamps and across the prairies, which had nearly killed both his horse and himself. The other volumes of his work were brought out in succession, with astonishing rapidity and regularity; the number of his subscribers increased, and before his death included perhaps every royal personage in Europe. In 1812 he was elected a member of the American Philosophical Society. In 1813 he published the 7th volume. He had completed the pictorial materials for the 8th and 9th when he was carried off by an attack of dysentery in his forty-eighth year. He died August 28, 1813, at Philadelphia. The 8th and 9th volumes were completed and published in 1814 by Mr. George Ord, who had been his companion in many of his exploring expeditions. Mr. Ord supplied the letter-press descriptions for these two volumes, as well as a biography of Wilson in the 9th. Three supplemental volumes were afterwards supplied by Charles Lucian Bonaparte, folio, 1822—1828.

Wilson’s pictorial representations of the birds are considered to be of great excellence. His descriptions are not only technically accurate, but strongly clear and graphic in whatever relates to their motions and characteristic habits. It is a delightful book. The mind is so much absorbed with the images and scenes as to be hardly conscious of the act of reading.

Wilson was about five feet ten or eleven inches in height, handsome and vigorous, but rather slender. He was always distinguished by the neatness of his dress and appearance. He was a man of the strictest honesty and the most scrupulous regard for truth; social, affectionate, and benevolent, but somewhat irritable under contradiction and critical objection. He was never married.

(Memoir of Wilson, annexed to the American Ornithology, by Alexander Wilson and Charles Lucian Bonaparte, in Constable’s Miscellany.)

WOOD FISH [Anarellis, P. C. S.]
WOLF BANE [Acanthum, P. C. S.]
WOOD, DECOMPOSITION OF [Timber, Preservation of, P. C.]
WODSDIA, a genus of ferns, having circular sori, with an inferior indusium, divided at the edges into numerous capillary segments. W. libeia is one of the rarest of our British ferns; it is found in only two localities in England, in Wales, and one in Scotland. It takes root in the fissures of rocks and in the bleakest part of mountainous places. The fronds are elongated, the pinnae triangular, with deep lobes, the rhizoma tufted. There are many species of this species, which are by some writers considered as distinct species, but Mr. Babington thinks this division unnecessary. (Babington, Manual of British Botany; Newman, British Ferns.)

WOOLFE, JOHN. [Gandon, P. C. S.]
WORMWOOD. [Artemisia Absinthium, P. C. S.]
WOUNDING. [Maim, P. C.]

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XANTHIAN MARBLES. These interesting marbles, which will shortly be opened to the public in the apartments built expressly for them on the western side of the British Museum, are the attention of the British collection of antiquities. They consist of a large collection of sepulchral marbles of various ages, which were first made known to the European public by Mr. (now Sir C.) Phillpotts, an authority on the subject. These marbles were the work of the Xanalytics, a small country on the southern coast of Asia Minor. [Avantolla, P. C. S.]

Xanthus is an ancient town, and was built on the river of the same name (now Echidn-Chali), at the distance of seventy stadia, or nine or ten miles, from its mouth. The first mention of the Xanthians in history is in the first book of Herodotus, c. 176, where he describes the capture and destruction of their city, in the middle of the sixth century a. c., by Harpagus, the general of Cyrus. Herodotus says that the Xanthians, after burning their wives and children, were all destroyed by the soldiers of Harpagus. He continues, that those who inhabited the city in its time were all foreigners except eighty families, who were absent on a foreign expedition. He says nothing of their monuments. Five centuries later nearly a similar fate happened to them when they were besieged by Brutus: the city was destroyed, and only one hundred and fifty Xanthians were left, says Plutarch, and this against them. Many of the monumental buildings of Xanthus must have perished in this second destruction: it was however again restored, as is evident from the Greek inscriptions and the state of its ruins when discovered by Sir C. Fellow. These different conceptions in some way account for the various characters of its monuments and inscriptions.

The origin of the Xanthian collection of marbles may be briefly described. In 1830 the attention of men of letters and artists, both in England and in other countries, was called to the subject by the following publication and its illustrations:—A Journal written during an Excursion in Asia Minor,' by Charles Fellows, 1838. In this account the remains of Xanthus were represented as of a very early age, and portions of its walls as Cyclopian. The ruins were in many places covered with inscriptions, many in a perfect state, but in an unknown language, which Mr. Fellows represented as resembling in appearance that of Phoenician or Etruscan. Many of the ruins, the rock tombs, were described as resembling those of Persepolis. The ruins consist of walls, temples, tombs, triumphal arches, and a theatre, and are situated in a site in a region of extreme distance, in 1832. Some crowned with rocks, others rising perpendicularly from the river, which is seen winding its way down from the woody uplands, at times becoming invisible between the mountains in which it rises. These picturesque ruins are covered with sculptures, and their elegant designs, says Mr. Fellows, evince the talent of the Greeks; and the highly poetical subjects of the bas-reliefs, some of them blending in one figure the forms of many, probably to describe its attributes, are also of Greek character.

The account of these ruins attracted more attention than their discoverer expected, and soon after the publication of his first journal, he made, in 1840, a second journey to Xanthus, to give a more satisfactory account of his discoveries. The results of this journey appeared in 'An Account of Discoveries in Xanthus, being a Journal kept during a second Excursion in Asia Minor,' by Charles Fellows.

In consequence of the more accurate and satisfactory account in this work, and the representations of various persons to the British Museum, a portion of the marbles, consisting of some of these Xanthian marbles and Xanthus and preserving them from further destruction, an expedition was fitted out in the autumn of 1841 for the purpose, and permission being obtained for the purpose. In the spring of 1842 the first expedition was deposited in the British Museum in 1842. In 1843 a second expedition was sent out, and the remainder of the Marbles arrived towards the end of the following year. The Marbles are large and many, and consist of many of the famous and the whole will be shortly opened to the public, partly arranged in the Museum as they were originally found by Sir C. Fellow. The tombs have been named, from their sculptures, the Winged-chariot Tomb, the Harpy Tomb, the Chimera Tomb, and others, according to their features. The figures were of the Xanthian collection. One, the Winged-chariot Tomb, was the work of a sculptor who had entirely produced the figures, the others in fragments. These two entire tombs, which were first made known to the European public by Mr. (now Sir C.) Phillpotts, an authority on the subject. The Xanthian collection. One, the Winged-chariot Tomb, is a remarkable one, and stood on the side of a hill. The marble being finely worked, the polish has greatly assisted in its preservation from the effect of the atmosphere. The roof is somewhat grey, and the fractures of the lower parts are covered by the red tint which white marble assumes after long exposure to the weather, and in places with yellow blended with brown. On the top or hog's nose is a hunting scene; some figures are running, others are on horseback galloping, with spears in their hands, and mantles blown by the wind, chasing a stag and a wild boar, which has turned to attack the pursuer. All the figures, though small, are, in the opinion of Sir C. Fellow, well formed and finished. On each of the sloping sides of the roof are two stones projecting about a foot, as found on all these tombs, but which upon this are carved into lions' heads crouching on their paws. Upon one side of the roof is a group, in which a warrior carrying a shield is in the act of stepping into his chariot, which is of the early simple form, with wheels of four spokes only; the driver is leaning forward, with his arms stretched out, holding the reins and a whip or goad; four beautifully formed horses, prancing in various attitudes, are attached to the chariot. It is nearly an old chariot and horses are carved on the other side of the roof, varying only in the attitudes of the figures. In the upper panels at the ends of gables are traces of small carved figures. On one side of the tomb (of which a sketch given in 'Journal' of 1838) under two lines of Lycian characters, is a group of figures, which, beginning from the left, is thus described by Sir C. fellows:—'A finely formed figure in a simple robe, his hands folded before him, and with a head of bushy hair, stands as if in attendance behind the chair or clawed seat of the principal figure, who, clothed in rich folded drapery, with short hair, sits in the attitude of a judge, with one arm somewhat raised; before him stand four figures: the first is mutilated, but appears similar to the second, who has long bushy hair, confined round the head, and looking like a wisp; his attitude is that of a counsellor pleading for the others; the loose robe falls gracefully from his shoulders, and is over, as most to conceal one arm; two other figures, differing only in having the hair shorter and the arms hanging down, stand apparently waiting the decision of the judge, and complete the well-formed group.' The word or name Palaea is inscribed over the judge. At the end, on a larger scale, are two figures of warriors, clothed with short mantles, and girded at the waist, their lions, above petticoats reaching nearly down to their knees. The back-ground of this bas-relief contains a long butt, from mutilation, illegible inscription: it is copied in the Second Journal. On the opposite end of the tomb are two other figures of the same size: one, clothed in a loose robe, stands in a commanding attitude; the spectator, with an arm raised over the head of a naked figure, also standing. (Second Journal, p. 166; where both ends are engraved.)

On the second side of the tomb, under a single line of inscription, is an animated battle-scene: men on horses are fighting with others on foot; all have helmets, and those on foot have shields; some fight naked, others with a loose shirt or blousc descending below the thighs, and confined by a belt round the waist. The horse of the principal figure is ornamented, and with the rider, has a kind of armour to protect his legs. The groups upon the two sides of the tomb are three feet six inches high by nine feet in length. The height of the whole tomb, including the base, is about twenty feet, or twice the width at the base. When first opened, it was found that the tomb was two feet six inches high, but it has been broken open in all its parts. In style of architecture it is the imitation of a wooden structure. Upon the other or Harpy tomb, a high square pedestal which was near the theatre in Xanthus, was readied to house a bas-relief. (First Journal, p. 232, and Second Journal, p. 170, Vol. 11—4 Y
where they are engraved.) On the four extremities of the north and south sides are four figures of similar design; the head is that of a man, a horse, and the body, which terminate the trunk, has wings and a tail like a pig's; from under the wings comes a bird's claw, clasping the legs of a child, which is carried in the bosom of the figure. The tomb has acquired the name of Phereclus, from the fact that Phereclus, king of Similis, was buried in it. The characteristic features of the figures of the charioteers and the costume of the figures of some pieces are of an early age. The forelock of the horses are tied in a peculiar way, similar to those of some horses in a bas-relief at Princeton and at American mounds, as well as the costumes, are in the Persepolitan sculptures the same as in the Xanthian specimens. The horses have also their interest; some resemble the subjects seen upon such Roman coins as the British Museum possesses; in short, there are some prominent objects in these Lycian sculptures. Many of the Greek inscriptions, already mentioned, appear to be subsequent to the Roman conquest of Asia, and some of them are of the time of the emperors.

None of them are of any service in pointing out the date of the various sculptures. They are translated in an 'Appendix to the Journal of the Second Excursion of Sir C. Fellows,' by Mr. Hermann Wiener. Few of them are however quite perfect. The same work contains an Essay on the Lycian Alphabet and Inscriptions, by Mr. Daniel Sharpe. The sculptures and ruins of Cadyanda, Myra, Limyra, Tlos, and the sculptures of the Piagia and the Acropolis in Lycia, appear to be equally interesting as those of Xanthus.

There are in the British Museum fragments of and casts from some of these marvels, as those of Tlos, Telmessus, and of Xanthus, besides many other drawings and paintings of the original sites of the various ruins and marbles, and of some of them entire models as they were first found by Sir C. Fellows in 1838. There is likewise a panoramic view of Xanthus with all its ruins, taken in 1839, from the Acropolis by Mr. George Scharf, who accompanied Sir C. Fellows on his expedition: there are also drawings of the operations of the excavators. In this panoramic view is a group of fragments of Xanthus, introduced; these fragments are now in the Museum, and as they appear all to belong to the same monument, and few pieces are wanting to complete it, a restoration of the whole has been attempted, and it will form one of the most striking features of the collection. It consists of a small amphiprotyle temple of the Ionic order, on a lofty stylobate pedestal without a base, but above a plain lower basement. It measured in height nearly 30 feet above the basement, and as much in length. The stylobate, being rather more than half the height of the whole, is ornamented with the bas-reliefs, and has a cornice with a deep egg-and-tongue moulding. The height of the columns, of which there are four at each end, is ten feet; and between and on the outer sides of these columns are altogether ten figures, five at each end, upwards of five feet in height, but much mutilated.

The pediments were ornamented with sculpture, and three small figures were found on the scotoma, and these figures were found from the Acropolis many beautifully wrought marbles are built in as materials, without any regard to their sculpture. Lions, warriors, chariots, and horses are to be traced in many fragments, and birds like our game-cocks fighting. On the site of a small temple Sir C. Fellows found a frieze about ten or twelve feet long and one in width, representing a series of fifteen small dancing figures with harps. There were the ruins of many small temples in the neighbourhood: Sir C. Fellows considered the sculptures to be Greek. He says however of the ruins generally—"Xanthus possesses some of the earliest archaic sculpture in Asia Minor, and this connected with the most beautiful of its monuments, and illustrated by the language of Lycia. These sculptures to which I refer must be the work of the sixth or seventh century before the Christian era. Many of these fragments have not been despoiled for the rebuilding of walls; and yet the decidedly more modern works of a later people are used as materials in repairing the walls around the back of the city and upon the mound. Many of these drawings, with names common among the Romans. The whole of the sculpture is Greek, fine, bold, and simple, bespeaking an early age of that people. No sign whatever is seen of the works of the Byzantines."

Many Greek inscriptions upon pedestals are built into the walls, which, says Sir C. Fellows, are mostly funeral, and belong to an age and people quite distinct from those of the many Lycian remains. Among the many inscriptions copied by Sir C. Fellows at Xanthus, there is a chaufette for 250 lines taken from an obelisk. (Second Journal, p. 168.) Many of these fragments of sculpture built into the walls of the scarpola are now in the Museum; they are also engraved upon the Temple of Selene and the Temple of the Dioscuri. The statuary of the charioteers and the costume of the figures of some pieces are of an early age. The forelock of the horses are tied in a peculiar way, similar to those of some horses in a bas-relief at Princeton and at American mounds, as well as the costumes, are in the Persepolitan sculptures the same as in the Xanthian specimens. The horses have also their interest; some resemble the subjects seen upon such Roman coins as the British Museum possesses; in short, there are some prominent objects in these Lycian sculptures. Many of the Greek inscriptions, already mentioned, appear to be subsequent to the Roman conquest of Asia, and some of them are of the time of the emperors.
one of the pediments also shows that the Persian is the defeated, not the victorious party. That monument is a creation of the Persians, not of the partings.

If this monument can be explained into a monument to Harpagus, it must have been executed about 150 years after the event commemorated; for though it may be hazardous to fix the time of construction of the monuments erected in the wake of a victorious army, there is no real risk in pronouncing when it was not executed; and there is evidence in the design and workmanship in this monument to show that it was not executed under the Persians. In fact, he is not represented as the Persian, or certainly not earlier than about 400 B.C., and probably considerably later. After a certain time, when mastery has superseded hesitation in design and unskilfulness of execution, the straight lines of the cramped stiffness of attitude are replaced by freedom and facility, with everywhere the evidence of a skilful expression of what was required. The journeys also by whom such marbles are executed, long accustomed to the easy mastery of the models of a finished age, themselves acquire peculiar characteristics of execution; a touch given with little trouble, by which much is accomplished; grown old in mastery, they become careless and free to extravagance in their execution. All these evidences are in this Xanthian monument: the draperies of the mutilated female statues combine the highest mastery in design with the utmost facility of execution.

Besides the works above quoted on these marbles, Sir C. Fellowes has published a pamphlet entitled 'The Xanthian Marbles,' in 1843, in order that they might be inspected. Their inscriptions are already incorporated in the 'Corpus Inscriptionum Graecarum,' by Aug. Boeckh and J. Franz, in the first part of the third volume of the Transactions of the Academy of Sciences of Berlin for 1844. Some corrections are ventured upon by the editors of this edition, especially in an inscription on a stake or column described as erected to a son of Harpagus, who was a celebrated boxer. (Kenneth, 1845, p. 322.)

XANTHII DIUM.

Some of the minute organic bodies in the chalk and flint of England are referred to this genus of Infusoria, but perhaps without sufficient reason. (Maull.)

XAVIER, FRANCIS, SAINT, was born at the castle of Xavier, in Navarre, on 7th April, 1506. His father, Don John de Jasso, was a counsellor of state to the King of Navarre, and his mother, Maria Azpilcueta, was heiress of the two illustrious houses of Azpilcueta and Xavier. Francis was the youngest of a large family of children, the eldest of whom bore the surname of Azpilcueta, and the others that of Xavier. Under the paternal roof he received all the advantages of their education, and by the talents which he manifested, induced his parents to send him at the age of eighteen to the Collège de Sainte Barbe, at Paris. It was there that he first became acquainted with Ignatius Loyola, and the discipline of his society, and he left it in 1528. Although he continued his studies, the history of Xavier is intimately blended with that of Loyola and his disciples. (Jasuits, P. C.; Loyola, P. C. S.)

Ignatius Loyola at Rome, where he and Francis Xavier first met, was active in the furtherance of his great design of associating a body of devoted men for the special service of the Church of Rome. While in that city, he exercised the functions of the ministry in the church of St. Lawrence in Damaso, and attracted to it large multitudes by his zeal and talents. Among them was a Portuguese of the name of Gove, who had been sent to Rome on a mission of importance by King John III. In his communications with the king he had expressed himself in terms of high commendation of the new society which had lately sprung up under Loyola; and had suggested the propriety of selecting missionaries from among the Jesuits to proclaim the Faith in the Portuguese colonies of Asia. Influenced by these representations, the king dispatched an order to his ambassador at Rome to obtain six members of that society, who might be willing to devote themselves to the work of missions in India. Later, the Jesuits on the island of Abozimas, where he baptized a large number of the inhabitants; he then preached the Gospel in other islands, and, having made a considerable stay in the island of Malacca, he returned to the European ports, and put to sea on his voyage to the island of Ceylon, where he converted the King of Ceylon and several of his subjects; on the 20th May, 1548, he returned to Goa. At Malacca, he had met with a Japanese of the name of Auger, named Augustus, an islander of the name of Abozimas, having been instructed in the faith, and induced to accompany him to Goa. The description given by this Japanese of the state of his native islands determined Xavier to go among them on making them acquainted with the true religion. Having baptized Auger, with two of his domestic, and given
him the more Christian name of Paul of the Holy Faith, he set out within four days at Grenville, and arrived at Macassar on the 15th August, 1549, at Canggorima, in the kingdom of Sambara, in Japan. [JAPAN, P.C.]

The chief difficulty he had to overcome in this new mission was his ignorance of the Japanese language. Xavier, urging his voyage, had, by means of his convert, acquired me little knowledge of it, which was increased by his stay of forty days at Canggorima, and which was sufficient to enable him to translate into it the Apostles’ creed with a short exposition. The little progress, however, which he made in it proved a serious hindrance to his success, as appears from the letters he sent home. Through his conversion, he was introduced to the King of Sambara, who gave him a favourable reception, but declined hearing him on the subject of religion. In the hope of finding a more suitable field for his missionary exertions, he left Sambara, and proceeded to Frando, the capital of another small kingdom. He was there allowed freely to exercise his ministry, and numerous conversions were the fruits of it: In that city he baptized more infidels, in twenty days, than he had done at Canggorima in a whole year. Encouraged by this success, he left those converts under the care of one of the Jesuits who had accompanied him, and set out for Meaco, the capital of the whole empire of that archipelago where he had an audience of Emperor, and all his court. [JAPAN, P.C.] On his way thither he visited Amanguchi, the principal town of the kingdom of Nagato, where he was allowed to pass the night before the king and his court, but his little success. After a month’s stay in that city, he continued his journey towards Meaco. Though it was the depth of winter, and the rugged roads, difficult at all times, were now rendered almost impassable by drifts of snow and mountain torrents, yet, thinly clad and barefoot, he journeyed onwards, resigned and cheerful. He arrived at Meaco in February, 1551, having been about two months on his journey. There his mean appearance and worn garments proved a subject of offence to the inhabitants; accustomed to the gorgeous rites and pompous ceremonies of their own religion, the priests, whose influence was paramount in that city, could not see in this humble Jesuit the ambassador of God. High though rejected with contumely, Xavier did not abandon his holy purpose, but returned to Amanguchi, where he provided himself with a rich mitre and a retinue of attendants, and thus attired presented himself before the court. This harmless device produced the desired effect; he obtained the protection of the king, and preached with so much success, that he baptized three thousand persons in that city. Those converts he left to the care of some Jesuits who had been the companions of his journey; and, accompanied by two Japanese Christians, who, rather than renounce the consolations of the religion he had taught them, had cheerfully suffered the confiscation of their property, were departed from Amanguchi, in September, 1551, and, on the 20th of November following, embarked to return to India, having remained in Japan two years and four months. The voyage was, for upwards of a hundred years after the death of Xavier, successfully continued by the Jesuits. [MISSIONS, P.C., vol. xv, p. 267.]

On his voyage he made some stay at Malacca, chiefly for the purpose of concerning measures with the government of that place for the prosecution of a mission to China. A serious obstacle to it was the law which forbids strangers, on the severest penalties, to enter that country. To remove it, it was agreed between Xavier and the governor of Malacca that an envoy should be sent to the name of the King of Portugal to establish a commercial treaty, and that Xavier should join it. On his return, however, to Malacca, he found the new governor, who had arrived there during his absence, opposed to the projected embassy, and, after many unsatisfactory entreaties to procure his compliance, he was obliged to embark alone for his intended mission on board a Portuguese vessel bound for the island of Sancian, near Macao, in China, a place where the Chinese were permitted to traffic with the Portuguese merchants. On arriving there, the merchants of Sancian endeavoured to dissuade him from his design of proceeding into China, but strongly persisted in the matter. Xavier however was not to be deterred; he provided himself with an interpreter, and entered into an agreement with a Chinese merchant to land him by night on some part of the coast. This plan also was frustrated by the Portuguese residents of Sancian, who feared that this attempt to infringe the laws might be visited upon them by the vengeance of the Chinese authorities. While thus disappointed in his first hopes, he fell severely sick. His sufferings, which were most acute, were aggravated by the inattention and want of skill of those around him; in the midst of them however he displayed a cheerful countenance and a holy resignation. He died on the 29th of December, 1552. His remains were brought over to Malacca on the 22nd of March, 1553, where they were received with the greatest honour; they were afterwards transferred to Goa, and deposited in the principal chapel of the church of Paul, on the 16th of March, 1567. The memory of Francis Xavier was consecrated by a ceremony known in the church of Rome by the name of Beatification, by the Pope Paul V., in 1609, and he was canonized as a Saint by Gregory XV. in 1623. In 1647, John IV. of Portugal, obtained a brief of Benedict XIV., which conferred on him the title of patron and protector of the East Indies. His feast is observed by the Church of Rome on 3rd of December.

This biography there is an error in the date both of his beatification and canonization; Biographie Universelle, tome ii.; and another states, in this work is by Lopéz; Fabre, Connaissance de l’Histoire Ecclésiastique de France, livres xxxiv., xxxix., cxxii., cxxviii., Lettres délibérantes et curieuses, écrites par des Missionsnaires de la Compagnie de Jésus, 40 vols. Paris, 1832, vol. xxvii., a work of great curiosity and interest, and not sufficiently known in England; P. Cyclo. art. ‘Missions’; the statement made in it that Xavier was canonized by Urban VIII. is erroneous, but it is true that this Pope gave him the title of the Apostle of the Indies. The Life of St. Francis Xavier has also been written in Latin, by Tursellini, Rome, 1604; in Italian, by Orlandino, Bartoli, and Maffei; and in French, by Bouchoux, a work which was translated into English by Dryden in 1686.

XULONIOSPRONITIES, one of the fossil fruits of Sheppey. (Bowerbank.)

XYLOPIA, a genus of plants belonging to the natural order Annonaceae. It has 6 petals and numerous stamens; the calyx from 3- to 5-lobed, the segments ovate, connate, and acute; the ovaries distinct and numerous; the ovules ascending in one row attached to the central axis; the fruit globular, dry, compressed, indehiscent, and stalked, and from 1- to 4-seeded.

X. longifolia is a tree 70 feet high, the leaves oblong, acuminate, silky, and shining beneath, revolute at the margin; the flowers sessile, axillary and smooth; the three outer petals oblong, linear, acuminate, silky, brownish, externally white, and excavated in the inside; the three inner ones linear, white, red at the base, 3-corrugated at the point.

X. glabra is a tree native of Jamaica and Barbadoes. The branches are smooth and scarcely dotted; the leaves oblong, ovate, smooth on both sides, obtuse at the base, acuminate at the apex, 1-flowered, solitary or in pairs. The calyx is smooth, trifid, with very stout lobes; the carpels smooth. The flower-buds are oblong, pubescent on the outside. The wood, bark, and heart of this tree are an agreeable bitter taste, similar to that of an orange-seed.

All the species of this genus require a stove-heat. They grow best in sandy loam and peat, and ripened cuttings will root in sand under a bell-glass in moderate heat.

(From, Gardner's Dictionary; Lindley, Flora Medica.)

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Y.

YELLOW SEA. [Huang-hai, P.C.S.]

YEMEN. [Arabia, P.C. and P.C.S.]

YORK, CUSTOM OF. [Witz, P.C.]
Z.

ZAMITEES, a genus of fossil Cycadeoidea from the colitic, wealden, and cretaceous formations (Pres.) synonymously with Mantellia and Brongniart. It is found in South Africa, at the western extremity of the Gulf of Aden, not far from the Straits of Bab-el-mandeb. It is situated in 17° 45' N. lat. and 43° E. long. The harbour is small and shallow, so that even small vessels can not enter it. It is only three miles from the town to the beach. The town is enclosed by walls now in ruins. The houses, with the exception of eight or ten, which are built of stone, are either of wood or reeds, or of both these materials. Some guns planted on the wall from the land side are sufficient protection against the Somalis, who inhabit the surrounding country. The population is not to exceed five hundred souls. All families are engaged in trade. Zella being one of the harbours by which the inhabitants of Hurras carry on a commercial intercourse with Arabia. Three caisles arrive annually from the interior, especially from Hurras. They bring to Zeila slaves, both male and female, large quantities of gum and myrrh, coffee, jowari, ghee, and ostrich feathers, also some grain, especially millet, wheat, and beans. Most of these articles are sent to Mocha, and at present probably also to Aden. In return they take back blue and white coarse cloth, Indian piece goods, European prints, silk, silk thread, shawls, red cotton yarn called shumlah, beads, zinc, copper-wire, frankincense, and Australian dollars. Zeila is subject to the Pasha of Egypt, by whose authority the Doleh of Moha nominates the Emir Zeila, who pays an annual tribute of 300 dollars, and keeps a garrison of seventy soldiers, armed in part with matchlocks.


ZAIM, SHAH. [SHAM ZAIM, P. C.]

ZINC, Medical Properties of.—In the purely metallic state, zinc produces no effect on the human system, but its combination with oxygen is sufficient to invest it with considerable power over the organs, both those with which it comes into direct contact and some remote ones, especially the nervous centres. Its local action is that of an irritant, astringent, and desiccative, while its remote action is that of a purgative. The acid acts upon the stomach, its properties are less than those of the sulphate or acetate, unless it meets with acids in the stomach. In this way it is rarely employed. It is for its remote effects, when taken in small long-continued doses, that it is valuable. While it has the properties common to all the metallic antispasmodics, it is distinguished by its power of restraining inordinate action of the nervous system; being calming and soothing. The brain and the function of sensation appear to feel less of its influence than the spinal chord. Hence the nerves of motion, and the functions of the circulation and respiration, are chiefly acted upon; it produces its effects speedily, but they quickly disappear when given in such doses as can be safely administered. The long continued use of it seems to produce a dryness and induration of the frame, which if carried to excess is dangerous, but the lesser degree of which is in all probability the source of the utility of this medicine, by diminishing the mobility of the irregularities in the circulation, and sudden congestions of blood, being the immediate causes of attacks of epilepsy and hysteria, the diseases which are most benefited by zinc.

In spasmodic affections of the chest, such as asthma, angina pectoris, and palpitation of the chest, when these do not proceed from organic derangements, oxide of zinc is often serviceable. In its use, the cramps of the stomach to which habitual drunkards are subject, is very useful.

Pure oxide of zinc is called tarry. It is sometimes used externally as a dusting powder, as a mild absorbent, on excoriations, and to heal chaps and cracks in the skin. It is also used as an ointment. Pure oxide of zinc forms an ointment of much value where an astrigent is needed, especially in the chronic inflammation of the skin.

Carbonate of zinc when impure is termed calamine; this after being subjected to diverse processes, is called prepared calamine. The only use made of it is to form an ointment, which is most useful as an application to burns, excoriations, and superficial ulcers.

Sulphate of zinc is in small doses a very valuable astringent, tonic, and antispasmodic; in larger doses it is a very certain and speedily acting emetic; and in very large doses it is poisonous. It is the sulpha of this element which excited the medical profession, as it is not so apt to inflame the stomach as tartrated antimony: but the stomach-pump is preferable to either. The tonic effects are best seen in affections of the mucous membranes. In the sanguineous catarrh of aged persons, and the extreme defluxions on the chest after influenza, sulphate of zinc affords a valuable remedy: it must be given in small doses, as the sudden suppression of the secretion may cause inflammation. The use of the solution as an injection requires the same caution.

Acetate of zinc is possessed of nearly similar properties, but in a weaker degree; and as an injection, seems in some cases entitled to a preference.

Chloride of zinc, called also butter of zinc, is a powerful escharotic or caustic; this action results from its strong affinity for albumen and gelatine, which principles it abstracts from the living tissues, and so forms an eschar. Its powers in this way have been taken advantage of to destroy parts affected with malignant diseases, such as cancer and lupus, and to remove newt matrial, or mother-marks. In none of these is it to be resorted to unless they are very superficial. Deep-seated cancer of glands can scarcely be removed by it, but other forms are often successfully treated by it. (Walh eOn Cancer, p. 219.)

Cyanide or cyanuret of zinc is a powerful antispasmodic and tonic. No medicine is so potent in allaying irritation of the stomach attended with great debility. The dose must be small and often repeated. Valerianate of zinc has lately been much recommended as a remedy against tic-douloureus and other nervous affections. Where the patients can tolerate the repulsive odour and puerescence in its use, it often proves very serviceable.

Zinc pans have been much recommended for use in dairies, as the milk specifically coagulates in them, and the quantity of cream is great; but if the milk become sour while in them, the acid acts upon the milk, and the white particles are perhaps not poisonous compounds. Upon the whole, white porcelain vessels, kept thoroughly clean, are the best material for milk-receivers.

ZINGIBER OFFICINALE:—(GINGER, Medical Properties of. The native country of this plant seems unknown, though Goebel asserts that it is Guinea. It is however extensively cultivated in China, Java, and the East and West Indies. From the composition of the zinc it is procured. Of this there are two varieties, the black and white; but some writers affirm that these are the produce of two distinct species, while others ascribe the difference to appearance to diversity of treatment after the rhizome is dug up. The rhizome or root-stock is perennial, but it is only that of a young plant, or the annual shoots from an old one, which are met with in commerce. When first dug up, the colour internally is red. The principal year's first year are used fresh, or preserved in sugar, and constitute the sweetmost as preserved ginger. This, when sent from the West Indies, is in small, round, tender pieces; when from the East, larger, flat, and stringy portions: the former is preferred.

Black ginger is stated to be the rhizome dug up, scaled in hot water, and dried in the sun. White ginger is also marketed, and then wrapped to free it from the soil before it is dried, which last operation is said to be effected by artificial heat, but probably mostly by the sun. Both kinds are very liable to the attacks of an insect: to prevent these attacks the rhizomes are dipped in a solution of lime, which destroys the insect of which often adheres to the surface. To cause black ginger to resemble the white it is bleached, after its arrival in this country, in a solution of chloride of lime, or exposed to the fumes of burning sulphur. This impairs the activity of the article.
Ginger occurs in commerce in pieces termed races, of various shapes, but generally flatish, branched, lobed, or palmated, rarely more than four inches long. The unscraped has a wrinkled epidermis; the scraped is devoid of this covering. Jamaica ginger, which is most esteemed in this country, occurs in races larger, rounder, and thinner than the other kinds; externally of a yellowish white, internally of a yellowish hue. The taste is agreeably aromatic and pungent, but this is lost with age, so that old pieces are worthless, as are also portions which have been digested in alcohol to form essence of ginger. Ginger when chewed excites a flow of saliva; the powder applied to the nostrils causes sneezing. The quantitative analysis of 100 parts of ginger has been given by Bucholz:—

<table>
<thead>
<tr>
<th>Component</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pale yellow volatile oil</td>
<td>1:56</td>
</tr>
<tr>
<td>Aromatic, acid, soft resin</td>
<td>3:60</td>
</tr>
<tr>
<td>Extractive soluble in alcohol</td>
<td>0:65</td>
</tr>
<tr>
<td>Acidulous and acid extractive, insoluble in alcohol</td>
<td>10:50</td>
</tr>
<tr>
<td>Gum</td>
<td>12:05</td>
</tr>
<tr>
<td>Starch (analogous to bassorin)</td>
<td>12:35</td>
</tr>
<tr>
<td>Apothemone, extracted by potash</td>
<td>26:00</td>
</tr>
<tr>
<td>Bassorin</td>
<td>8:30</td>
</tr>
<tr>
<td>Woody fibre</td>
<td>8:00</td>
</tr>
<tr>
<td>Water</td>
<td>11:90</td>
</tr>
</tbody>
</table>

102:31

Morin's analysis yields also acetic acid, acetate of potash, and sulphur; while the ashes give numerous metallic salts and alkaline salts.

The volatile oil is of a pale yellow, lighter than water; taste at first mild, then hot. The soft resin, obtained by digesting the alcoholic extract of ginger first in water, then in ether, and evaporating the ethereal tincture, is not quite ana-

logous to the principle zingiberin, procured by Beral, and by him termed peperaud. This last is got by submitting ginger directly to the action of sulphuric ether. Beral recommends many preparations of this principle, but, except from their smaller bulk, it is difficult to perceive what advantage they possess over common ginger and its preparations. Ginger is an aromatic stimulant of considerable power. The effects are greater on organs with which it comes into direct contact than on remoter ones. Thus, when chewed, it is a powerful stylogue, and relieves tooth-ache, rheumatism of the jaw, and also relaxed uvula. When received into the stomach, it promotes digestion in languid habits, and relieves flatulent colic. Gouty subjects are much benefited by it, and for such persons no form is more beneficial than that of preserved ginger taken at dessert after a mixture of viands. But it has the disadvantage of impairing the flavour of the wine taken at the same time.

The action of ginger on remote organs is greatest on the mucous membranes. Hence the lungs are markedly excited in the relaxed and suffocative catarrah of old people. The mucous membranes of the urino-genital organs are also excited by it in languid habits; many feeble females receive much advantage from the domestic preparation termed ginger-tea. Some headaches of a sympathetic kind, originating in irritation of the intestinal canal, are often relieved by it. A poultice of scraped ginger, to which warm water has been added, forms a substitute for a mustard poultice, and often relieves headache when applied to the forehead. Ginger-beer is often a grateful beverage in summer heat, but with some persons it disagrees; this is owing to the sugar; for if made without it, it agrees with such persons well. Lemon-juice, when taken with sugar, often disagrees, as for example with pancakes. The lemon-juice alone is most wholesome.

ZUMALACARREGUI. [Spain, P. C., p. 300.]

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